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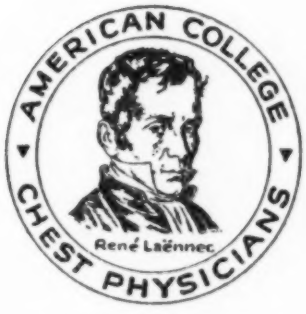

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DISEASES *of the* CHEST

VOLUME XIII MAY-JUNE, 1947 NUMBER 3

The Tuberculous Veteran, Plans for His Future Care*

ROY A. WOLFORD, M.D., F.C.C.P.**
Washington, D. C.

In the first World War, excluding battle injuries, tuberculosis was the second leading cause of discharge for disability of officers and enlisted men of the Army during the period April 1917 to December 1919, inclusive. Tuberculosis accounted for 22,390, or over 12 per cent of the 178,699 discharges for disability recorded.

The accredited number of persons in military service during World War I, was 4,757,240. By June 30, 1922, less than four years after active hostilities had ceased, compensation for service-connected tuberculosis had been granted to almost one of every 130 individuals, or a total of 36,600 living veterans who had served in that conflict. The number of cases on the compensation rolls whose major disability was tuberculosis, increased to a peak of 63,932 by the year 1933.

On January 1, 1946, there were still almost 60,000 disability cases from the earlier conflict on the compensation and pension rolls for tuberculosis, of which about 50,175 were service-connected and over 9,775 were suffering with a total permanent disability not attributed to service.

Roughly, in a period of a quarter of a century, 2½ per cent of the individuals alive or deceased who served in the first World War were known to have contracted tuberculosis of a compensable degree.

There are still 15 per cent of the total World War I compensation service-connected disability awards being paid for tuberculosis as the major disability.

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**Assistant Director, Tuberculosis Service, Veterans Administration.

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What is the comparable picture presented in tuberculosis among veterans of World War II? For the present, that picture cannot be etched too clearly; but it can be stated that on the first anniversary of V. E. Day, only a little more than one and one-half per cent of the disability pension cases of veterans who served in the Army, Navy, Marine Corps or Coast Guard on or after December 7, 1941, were for tuberculosis. This is a heartening circumstance.

From the data currently available, although the period of World War II was three times as long and the eventual number of individuals who served in the military service during World War II will be as much as four times that accredited to the first World War, the tuberculosis case load of the Veterans Administration should prove to be not much greater than that experienced after the first world conflict. The 150,000 tuberculous individuals who have been prevented, according to Colonel Esmond R. Long, from entering the armed forces by the use of the chest x-ray in the pre-induction examinations will weigh heavily in supporting an estimate that, of the total of all pension cases on the Federal rolls after World War II, the percentage for tuberculosis will be smaller than after World War I, perhaps not more than two per cent of the whole.

The number of tuberculous veterans treated at Federal expense in hospitals after the last war did not exactly parallel the trend that was manifest in the yearly total of disability cases for tuberculosis on the compensation rolls.

The most active year in the experience of the Veterans Administration, insofar as hospital admissions and discharges of tuberculous beneficiaries are concerned, was the fiscal year 1922, approximately three years after the Armistice of November 11, 1918.

From then on there was a steady decline in the number of tuberculous patients remaining in hospitals. By the end of 1923, the neuropsychiatric hospital load for veterans approximated and soon exceeded the number of tuberculous beneficiaries being treated in hospitals, but it was not until the year 1928 that the monthly total of general medical and surgical patients under hospital care had become greater than the number under treatment for tuberculosis. This change in the type of the hospital load among veterans was in good measure the result of successive statutory amendments to the basic compensation law. The presumption of service origin of neuropsychiatric and tuberculous disabilities which had developed to a ten per cent degree, was by law first authorized for two years after discharge; was lengthened later to three years; then in the Act of June 7, 1924, was finally authorized by the Congress for up to January 1, 1925 (or over six years after the Armistice of November 11, 1918). The same Act extended benefits of hospitaliza-

tion to veterans suffering with non-service connected disabilities, including tuberculosis.

The tuberculosis hospital load has now, again materially increased.

In all hospitals, admissions for tuberculous veterans having service in the armed forces after December 7, 1941, have approximated seven (7) per cent of the total admissions for all disabilities. By February 28, 1946, more than 23,600 admissions of tuberculous World War II veterans had been made to our hospitals of which about 16,100 were admitted for the service-connected tuberculous disability. The tuberculosis of more than 7,500 of these admissions was not service-connected.

The Veterans Administration is now operating over 8,650 tuberculosis beds with 6,000 located in fourteen (14) tuberculosis hospitals and 2,650 in tuberculosis departments of fifteen (15) general hospitals. In addition, there are 775 beds in twenty-two (22) neuropsychiatric hospitals for tuberculous psychotic male and female beneficiaries.

The scope of the tuberculosis problem confronting the Veterans Administration is fully realized by all of us who are responsible for the future application of this program. We recognize the practical task of dealing with it will require extensive facilities and constant intelligent effort. There are five (5) fields of endeavor which must be adequately covered:

(a) Preventive, through control of the infective pool and periodic chest x-ray surveys of all personnel.
(b) Early diagnosis to be implemented by chest x-ray studies of all veterans examined on an outpatient status or admitted to any type of hospital.
(c) Prompt and effective definitive treatment.
(d) The control of all relevant social factors.
(e) Rehabilitation and protection following treatment.

Adequate control of the infective pool can be accomplished only through a sizeable increase in tuberculosis beds and the recruitment of personnel to man them. By the middle of 1947, it is expected new construction will be completed at three (3) existing hospitals and on seven (7) new sites already selected which will result in an increase of approximately three thousand (3,000) beds. By the acquisition of two (2) Army hospitals, eleven hundred (1100) additional tuberculosis beds will be obtained and later through the conversion of five (5) general hospitals to tuberculosis hospitals, nineteen hundred (1900) more beds will be secured. Thus, exclusive of beds for tuberculous psychotic patients, there will be approximately fourteen thousand six hundred (14,600) tuberculosis beds available by January 1, 1948.

Our future plans call for five (5) types of institutions for the hospital treatment and post-hospital care of tuberculous veterans. Briefly, they may be classified as follows:

1. Units of approximately 150 beds each at over a score of our neuropsychiatric hospitals which will be equipped to render highly specialized care to tuberculous psychotic patients. Several of these units will be staffed as thoracic surgery centers for major collapse therapy in psychotic beneficiaries with tuberculosis.
2. Departments of not less than 100 beds in general hospitals for the treatment, near their families, of tuberculous patients who require constant bed rest.
3. Rural sanatoria for patients who are ambulant in any degree and who may be expected to improve with definitive treatment. Our present tuberculosis hospitals can be adapted for utilization as this type of sanatorium.
4. "Health resorts," with proper segregation from the nearby community, for ambulant patients with positive sputum for which definitive treatment is not effective or a therapeutic regimen of this nature has been declined by the patient.
5. Communities for ambulant patients who have negative sputum but who are handicapped by emphysema, other complications or a concomitant disease to an extent that does not permit them to engage in the regular rehabilitation program for the tuberculous.

Recruitment of many experts in tuberculosis, thoracic surgery and the allied specialities has been made possible through more attractive salaries, increased chances for professional advancement and the greater prestige that will come with better opportunities to practice medicine which has resulted from the establishment of the Department of Medicine and Surgery in the Veterans Administration in early January of 1946. A number of the new appointments to the Department of Medicine and Surgery, in the higher grades have been tendered certain of the better trained, older physicians with teaching experience, from various sections of the country, who are recognized leaders in the field of tuberculosis. These teachers, in conjunction with a recent broadening of the consultant services at several tuberculosis hospitals located near teaching medical centers and in collaboration with the medical schools in proximity, will permit us to establish adequate teaching facilities for residencies in tuberculosis and thoracic surgery and to train the younger physicians under nationally recognized leaders in medicine and thus interest the young medical graduates in tuberculosis and a career in the Veterans Administration.

To insure early diagnosis and the application of prompt treatment of tuberculosis among the younger veterans, chest x-rays of each hospitalized patient at time of admission and each out-patient at time of scheduled examination, regardless of the disability for

which hospitalized or examined, with periodic survey of all general and neuropsychiatric patients at the end of each twelve (1) months' residence in hospital, have been authorized. The chests of over a million veterans will thus be x-rayed annually. By this case-finding procedure alone many lives will be saved and untold days of invalidism will be spared the veterans of this war who contract tuberculosis.

To render effective definitive treatment, minimum standards for the examination and treatment of tuberculous beneficiaries have been promulgated and improved methods of reporting active cases of tuberculosis among veterans have been effected.

Liberalization of regulations to permit the early re-hospitalization of patients with positive sputum, who have previously left the hospital against the advice of the physician, has been made and regulatory measures to encourage continued hospitalization in cooperative patients in this classification have been amplified. These procedures serve a two-fold purpose, firstly, by providing for a relatively uninterrupted hospital treatment program for those patients who are compelled because of urgent economic or social reasons to leave the hospital for a short period of time while these difficulties are being personally adjusted and, secondly, by controlling, in part, the infective pool of communicable pulmonary tuberculosis in the veteran population.

Measures for frequent and thorough post-hospital follow-up care have been established. It is hoped through quarterly re-examination on an out-patient status, of all recently hospitalized tuberculous patients, to reduce the number whose disease becomes reactivated, to arrange a more happy and secure convalescence and to induce an earlier readjustment of the tuberculous veteran to his eventual place in the civilian economy.

Our social work staffs are being expanded as workers interested in tuberculosis become available. It is the eventual objective to have at least one social worker for every one hundred and twenty-five (125) tuberculous beneficiaries being cared for in the hospital. Through active liaison with voluntary and contract social work agencies in the patient's home community, it is hoped many of the social and economic factors which beset individuals hospitalized for a long period of time, can be alleviated.

In the present reconversion period, increased emphasis is being placed on early rehabilitation of the disabled individual regardless of whether his handicap has been contracted in the armed forces or in industry. Among our younger tuberculous veterans there is an insistent demand for diversional and pre-vocational activities that will be of some future use to the patient, or will prove of benefit to him in his educational program.

To meet this new interest, educational instructors and rehabilitation directors are being placed on duty at our tuberculosis hospitals as qualified appointees are found. Correspondence courses to supplement individual and group instruction in commercial and academic subjects by educational instructors have been authorized.

It is our intention to develop the hospitalized veteran's sense of responsibility and interest by coordinated planning at the appropriate point with the patient relative to his health and occupational goal and through evaluation of the role which each specialty of therapy in the hospital and the patient himself may contribute to its accomplishment. Under the leadership of the clinical director therapy conferences are convened at periodic intervals, attended by the ward physician, the social worker, the rehabilitation director, the occupational therapy aide, the librarian, and the recreational aide. As promptly as feasible after the veteran's admission to the hospital, his case history is thoroughly studied to determine the steps which each specialty will undertake in the readjustment of the patient's vocation.

In collaboration with the National Tuberculosis Association, a demonstration unit was established at one of our tuberculosis hospitals through the employment of a full-time vocational counseller who conducted aptitude tests and guidance interviews. He assisted other members of the committee on rehabilitation for the hospital by authoritative reports on the future types of employment proposed by the patient or indicated by the results of his studies. This has permitted us to form objective conclusions as to the adaptability of this type of service to the treatment of hospitalized tuberculous beneficiaries and we are, accordingly, expanding this service to other tuberculosis hospitals.

For some years we have utilized beds in contract hospitals for female beneficiaries suffering with tuberculosis. Until recently the Veterans Administration has been able to care for its male tuberculous beneficiaries in its own hospitals. The established tuberculosis hospitals of the Veterans Administration are now filled to capacity. Four hundred veterans whose tuberculous disability was not incurred in service are awaiting admission to our hospitals. The Army and the Navy are retaining several thousand soldiers and sailors in the service hospitals under definitive treatment for tuberculosis until beds can be secured for them in Veterans Administration Hospitals or through contract beds in private, municipal, county and State hospitals. For the immediate future, large blocks of contract beds for male and female tuberculous beneficiaries are required. An intensive effort is being made through the Regional Offices to secure as many contract beds in non-Federal hospitals as possible. Currently we have been able to ne-

gotiate contracts for a little over twelve hundred (1200) tuberculosis beds in sixty-eight (68) sanatoria. Unfortunately, hospitals under other than governmental control are beset with similar personnel shortages as are Federal hospitals so that the search for contract beds has not proved as fruitful as we had anticipated. It is hoped, as the release of physicians and nurses from the Army and the Navy continues, that many more private sanatoria and tax-supported municipal, county and State tuberculosis hospitals will see their way clear to enter into mutual advantageous contracts with the Veterans Administration to care for its tuberculous beneficiaries.

Those who are directing the tuberculosis program in the Veterans Administration hope, in the not too distant future, to assume some of the responsibility for research in tuberculosis and with that objective in mind administrative authorization for a research institute for tuberculosis has been secured.

The inauguration of a research project of this proportion must await the time when a staff of scientists qualified to undertake this work can be assembled.

SUMMARY

Tuberculosis accounted for over 12 per cent of the discharges for disability of officers and enlisted men of the Army during a 33-month period in the first World War.

Of the total World War I compensation service-connected disability awards still being paid by the Veterans Administration, 15 per cent are for tuberculosis as the major disability.

Currently only 1.5 per cent of the disability compensation cases of veterans who served in World War II are receiving awards for tuberculosis.

The Veterans Administration is now operating over 8,650 tuberculosis beds. Contract beds in private, municipal, county and State hospitals are also being utilized.

Measures to insure early diagnosis, application of prompt effective definitive treatment, frequent and thorough post-hospital follow-up care have been established; medical, nursing and social work staffs have been expanded; and increased emphasis is being placed on early rehabilitation of the disabled tuberculous veterans.

Future plans call for five types of institutions for the hospital treatment and post-hospital care of tuberculous veterans.

1. Units of 150 beds each for specialized care of tuberculous-psychotic patients.
2. Departments of not less than 100 beds in general hospitals for patients who require constant bed rest.

3. Rural sanatoria for ambulant patients under definitive treatment.
4. "Health resorts" with proper segregation for ambulant patients with positive sputum not under definitive treatment.
5. Communities for ambulant patients with negative sputum handicapped by complications or a concomitant disease.

RESUMEN

Más del 12 por ciento de los oficiales y soldados del Ejército que fueron dados de baja por razón de invalidez, durante un período de 33 meses en la primera Guerra Mundial, sufrían de tuberculosis.

Del total de indemnizaciones decretadas en la primera Guerra Mundial por incapacidad contraída en el servicio militar y que aún continúa pagando la Administración de Veteranos, en el 15 por ciento la tuberculosis constituye la incapacidad principal.

En la actualidad solamente el 1.5 por ciento de las indemnizaciones por incapacidad acordadas a los veteranos que participaron en la segunda Guerra Mundial lo fueron con motivo de la tuberculosis.

Actualmente la Administración de Veteranos mantiene más de 8,650 camas para tuberculosos. También se utilizan camas contratadas en hospitales privados, municipales, de los Condados y de los Estados.

Se han establecido medidas para asegurar el diagnóstico precoz, la rápida aplicación de un tratamiento eficaz definitivo y el cuidado posthospitalario frecuente y completo; se ha aumentado el número de médicos, de enfermeras y de auxiliadores sociales, y se le presta más atención a la pronta rehabilitación de los veteranos tuberculosos incapacitados.

Hay además el propósito de establecer cinco tipos de instituciones para el tratamiento en hospitales y el cuidado posthospitalario de los veteranos tuberculosos, a saber:

1. Unidades de 150 camas cada una para el cuidado especializado de los tuberculosos con enfermedades mentales.
2. Departamentos de no menos de 100 camas en hospitales generales para pacientes que necesitan descanso en cama contínuo.
3. Sanatorios rurales para pacientes ambulantes bajo tratamiento definitivo.
4. Colonias para enfermos, con separación adecuada para pacientes ambulantes con esputo positivo que no se encuentran bajo tratamiento definitivo.
5. Colectividades para pacientes ambulantes con esputo negativo que sufren de impedimentos por motivo de complicaciones o de enfermedad concomitante.

Discussion*

ARNOLD SHAMASKIN, M.D., F.C.C.P.**
Hines, Illinois

Dr. Wolford's excellent and comprehensive presentation illustrates the extent to which the Veterans Administration is planning to make available to the war veteran the facilities for treatment and rehabilitation which are consistent with the most advanced thoughts in the management of tuberculosis.

A survey of patients admitted to the Tuberculosis Service of Hines Hospital during the early part of the war showed a vast predominance of minimal and moderately advanced cases. These cases were discovered, to a great extent, during the course of routine x-raying of various groups for one reason or another while the men were still in the armed forces. As the war progressed and came to an end, with the resulting acceleration of discharges from the armed forces, a gradually increasing percentage of far-advanced cases has been observed among our admissions. Many of these cases were discovered at home after the onset of symptoms.

It was shown by Dr. Wolford that whenever a veteran is examined for any purpose whatsoever at a Veterans Administration station, a chest x-ray is made routinely. Thus there will be carried on a continuous tuberculosis survey of a considerable sector of our population. There remains, however, the bulk of war veterans whom the Veterans Administration cannot reach under the existing laws. These are the veterans who have no occasion to come within the sphere of the medical branch of the Veterans Administration. Local agencies will have to include this group of veterans in the mass roentgenographic surveys which are incorporated in the future plans for the control of tuberculosis.

A serious problem still remaining to be solved is how to retain the patient continuously hospitalized until treatment is completed. It should be emphasized, however, that this problem exists not only in Veterans Administration Hospitals but also in non-Federal institutions throughout the country. Tuberculosis Topics[1] reports that approximately thirty per cent of patients in all tuberculosis hospitals left against medical advice during the war years. Drolet[2] made a survey of tuberculosis patients discharged from 41 institutions in the New York Metropolitan area. He found that out of

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**Chief, Tuberculosis Service, Veterans Administration Hospital.

4,015 patients discharged during the first half of 1945, approximately 35 per cent left against medical advice. At the Hines Veterans Hospital, 32 per cent of all discharges from the Tuberculosis Service were against medical advice in 1945.

The study of the causes for irregular discharges from tuberculosis hospitals, and of the measures to be taken for their prevention, must therefore be as high on the agenda of every organization interested in the control of tuberculosis as it is i nthe Veterans Administration. Undoubtedly the reasons vary to a certain extent among different groups of patients and in different types of hospitals. A review of the table prepared by Drolet[2] shows an unusually high rate of discharges against medical advice among hospitals having the most modern buildings and equipment and known to be very well staffed and managed.

Canada is said to have developed a very effective method for the control of irregular discharges among veterans. I have had no opportunity to check on the details of this system, but apparently it consists of imposing a series of gradually increasing fines, beginning with two dollars for the first offense and going up to one hundred dollars for the fourth and subsequent offenses. A system like this has a great deal in its favor.

Among the plans for the future care of the tuberculous veteran, several measures such as: the establishment of five different types of tuberculosis hospitals, for which credit must be given to Dr. John Barnwell, Director of the Tuberculosis Service of the Veterans Administration, also the follow-up system and above all, the rehabilitation program will no doubt favorably influence the continuity of treatment.

It was shown by Dr. Wolford that in the plans for the future care of the tuberculous veteran the strongest emphasis is being placed on early rehabilitation. The intelligent young person whose mental processes are not impaired by the toxemia of an acute febrile disease, or by severe bodily discomfort, finds it frequently very difficult to lead the vegetative life necessitated by the prolonged bed rest in the treatment of pulmonary tuberculosis. As imperative as complete physical and mental relaxation is, we must recognize the fact that the average young tuberculous patient is bound to be frequently disturbed by thoughts of the future. This, in turn, affects adversely the continuity of treatment. In order to prevent such a person from lapsing into a state of mental stagnation, and to provide for him an added incentive to remain in the hospital until treatment is completed, it is necessary to start his industrial rehabilitation as soon after admission as his physical condition permits. Expert guidance is as essential for one as for the other. To leave the rehabilitation to chance is as im-

practical and as unscientific as to leave the management of his medical treatment to his own devices.

With this idea in mind, and in accord with the concept of the Veterans Administration, there was organized during the latter part of 1945, on the Tuberculosis Service of Hines Hospital, a rehabilitation team consisting of a trained vocational rehabilitation counselor, an academic instructor, the social worker, and the physician. Under this program, it will be possible for patients to obtain high school and college credits while still under hospital care. One of our patients was already awarded a high school diploma.

The Veterans Administration recognizes that the modern tuberculosis hospital is a great deal more than a place where only the disease is treated. It considers that a well-planned and well-executed program of rehabilitation, carefully integrated with the therapeutic regimen, designed to fit in with the post-hospital program of rehabilitation, is a vital function of the modern tuberculosis hospital. Treatment and rehabilitation are viewed by the Veterans Administration as parts of one continuous program for the purpose of fitting the tuberculous veteran back into the social fabric as a useful, self-supporting and self-respecting member of the community.

REFERENCES

1 "Tuberculosis Topics," *National Council of Jewish Tuberculosis Sanatoriums*, Denver, Colorado, 1:5, 45.

2 Drolet, G. J.: "Special Report," 1945; *New York Tuberculosis and Health Association*.

Discussion

FORREST G. BELL, M.D., F.C.C.P.
San Francisco, California

Having worked for many years in this field with Dr. Wolford, I feel considerably honored to be able to take part in a discussion of his presentation.

The most important therapeutic measure for the treatment of pulmonary tuberculosis is still that of rest. By rest we mean psychological rest as well as physical rest.

In order to relieve the patient from worry, fear and anxiety associated with personal, domestic or economic problems, the auxiliary medical agencies such as Social Service, Red Cross and

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*Branch Medical Director, Branch 12, Veterans Administration.

recreational facilities may be used to advantages in providing psychological rest for the individual patient.

Another procedure of extreme importance in establishing psychological rest is that of proper orientation of each patient regarding his disease and the treatment program to be followed during his stay in the Veterans Administration Hospital. A brief concise orientation on the transmission, diagnosis and treatment of tuberculosis should be given each new veteran patient. The patient should understand that psychological and physical rest is the most important phase of the treatment program. A brief description of some of the surgical procedures should be presented so that a patient may obtain authentic information about such methods of treatment.

Finally, through the medical rehabilitation program, the patient should be offered hope for early recovery and early restoration to his social environment.

It should be pointed out that one of the chief aims of the medical rehabilitation program is to get the patient out of the hospital as soon as he is physically, psychologically and economically able to leave.

During the early stages of the treatment of tuberculosis the emphasis of medical rehabilitation is on education, including reading, recreation and vocational counseling. Pre-vocational training should be started as soon as possible. Plans should be made by the patient for the kind of training he wishes to receive while in the hospital as well as the kind of vocation he plans to follow when he leaves. While the patient is bedfast occupational therapy, educational films, lectures and recreation facilities are to be used to the fullest extent.

When the patient becomes ambulatory pre-vocational training is supplied by the retraining division. This program provides a wide variety of educational subjects and vocational training in the form of practical experience in hospital shops which are to be set up as a part of the medical rehabilitation program. Adequate vocational guidance will be provided early and continued advice and assistance is to be supplied throughout the course of treatment.

Another recent innovation in the medical rehabilitation field is the establishment of a rehabilitation board in each hospital. The chairman of the board is a medical officer. Other members are the psychiatrist, Chief Medical Officer or ward surgeon, social service worker, physical therapist, occupational therapist and any other personnel of the hospital staff considered desirable as a member of the board. The board will consider the overall picture of the treatment program for each patient and will make final

recommendations for the program to be followed in each individual case.

It is believed that this approach to the treatment of tuberculosis will encourage active cooperation on the part of the patient in the treatment of his disease and it is hoped that a bigger percentage of arrest and a lower incidence of relapse will be accomplished.

Tuberculosis Program in Grand Rapids, Michigan

J. VINCENT SHERWOOD, M.D.*

Grand Rapids, Michigan

The fight against tuberculosis has had many champions. Many agencies have sponsored its cause. Only when all those agencies can combine and co-ordinate will we have an efficient program.

The fact that Grand Rapids had the distinction of having the lowest tuberculosis death rate among the 92 largest cities of the country (those over 100,000 population) is no mean accomplishment. It is interesting to hear all the many explanations for this. A few of those reasons given are:

The large percentage of sturdy Dutch people;

The lack of slum areas;

The lack of large industries.

The population is not entirely Holland Dutch! We have as many of Slavic and other backgrounds. We have our share of basement apartments, dark rooms and dilapidated homes. The percentage of small plants is a hazard and not a help. Many of these small plants are metal working industries and they have no full time health department or program. Many have a very scant pre-employment examination and the medical care is first aid for accidents.

It is surprising that no one would suggest that the tuberculosis program as carried out might be the reason for Grand Rapids enviable position. We have had our problems in tuberculosis, but Grand Rapids has been fortunate in having certain personalities pushing the tuberculosis program in the community. I feel free to say this inasmuch as I have had nothing to do with that program up to the 1944 period in which the low death rate of 15.8 was obtained.

It would be interesting to outline the program as carried out in the community and then point out certain places that coincide with marked changes in the death rate as shown on the accompanying graph.

The tuberculosis control program in the Grand Rapids area is divided among several groups, official and volunteer, so that interest is widely spread. This is important for any problem which requires so much education. Health Officers cannot use their power nor sanatorium specialists treat their patients until they are found. Cases will not be discovered unless everybody knows what causes

*Superintendent and Medical Director, Sunshine Sanatorium, Grand Rapids, Michigan.

tuberculosis and how it acts—unless they know that tuberculosis may be carried by people without evidence of symptoms and that it can more easily be cured if found and treated early. Lay people working with professionals learn more than they do by merely hearing or reading the facts. Our various media of control, all available at public expense, include:

1. Education
2. Case finding
3. Checking of contacts
4. Treatment
5. Follow-up
6. Rehabilitation

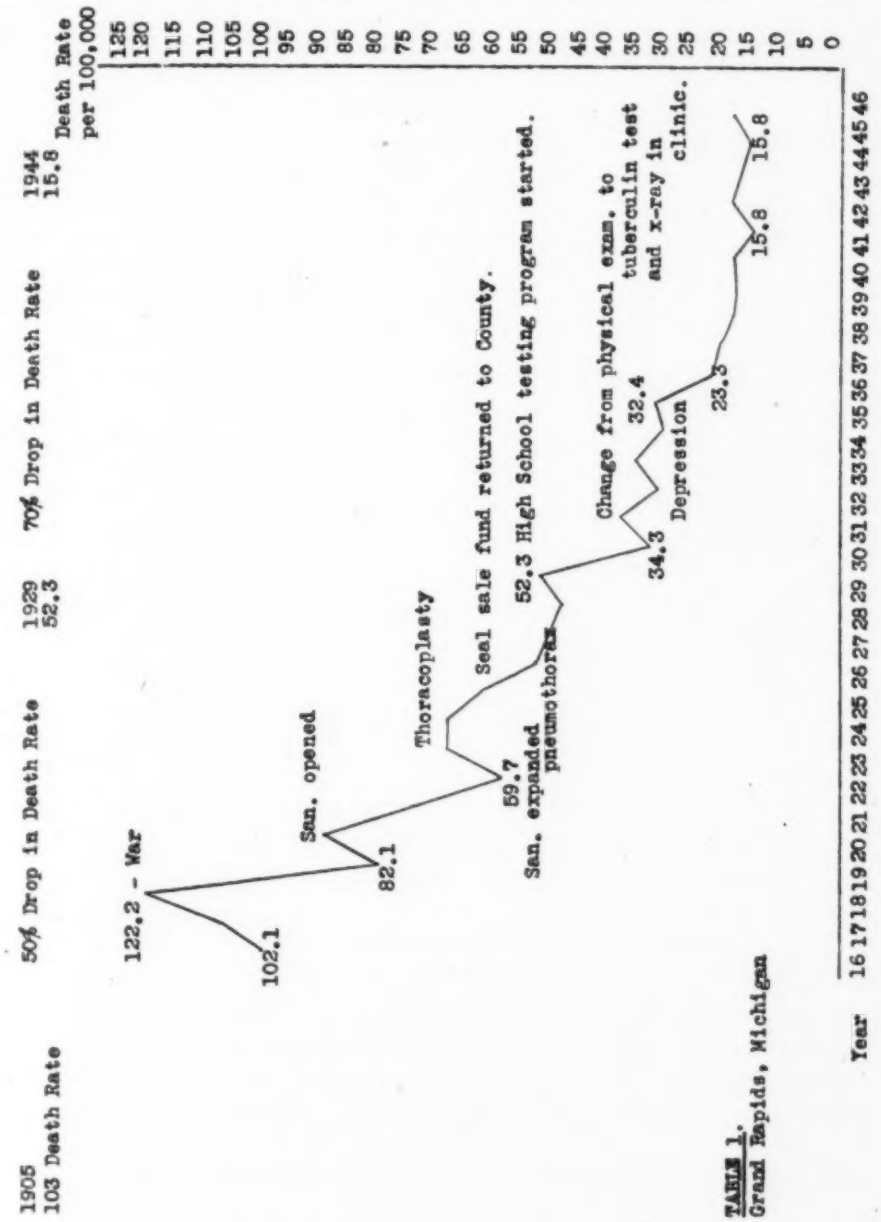

TABLE 1.
Grand Rapids, Michigan

1. *Education* should be the keystone of any tuberculosis campaign and, if education is carried out, with services rendered, it becomes doubly effective. While the responsibility for the control of tuberculosis belongs to the government (through our health departments), in a democracy that means the people. A wise Health Officer recognizes that, and utilizes every ounce of interest and every dollar a group of volunteers can bring to bear on this problem. Grand Rapids' tax supported services have been handicapped by a 15 mill tax limitation on property. Health departments, both city and county, have had to work on limited budgets.

Our formal educational program is conducted chiefly by the Grand Rapids Anti-Tuberculosis Society through: lectures, motion pictures, pamphlets and posters (especially in schools and industries), through institutes, exhibits and the news columns. The Grand Rapids Anti-Tuberculosis Society has a very well informed, ambitious and energetic Secretary.* She had training in the tuberculosis program for eight years before taking over the Executive Secretary office. Some time was taken out of those eight years for Army service. After the first World War (1923) the executive position was taken by the present secretary, Blanche deKoning.

No matter how much knowledge one has of tuberculosis and its program, nothing can be accomplished unless that information is put to work. The Grand Rapids Anti-Tuberculosis Society has put first things first and has not been swayed by any political implications the program might present. A great deal of credit for any success Grand Rapids has in its program must be given to this Society and its leadership. In 1929 the Society started a tuberculin testing program in high schools and colleges which was the first in the state. It was soon discovered that such a project should be preceeded by tuberculosis educational work among the faculty, students and Parent-Teacher Association. Time has shown that a tuberculin reaction provides a golden opportunity to educate the reactor and his family about tuberculosis. Thus early in the campaign an intensive follow-up program was initiated with two or three well informed nurses calling in the homes of all reactors. Some adult carriers were found and hospitalized. This plan of education and service later spread throughout Michigan with telling results.

The work in the schools proved so effective that it has been extended to the industries of the county. First an educational program is instituted among employers and employees through bulletins, posters, and distribution of literature. This has resulted in excellent cooperation; in fact, in most plants the response for

*Mrs. Blanche deKoning, Executive Secretary, Grand Rapids Anti-Tuberculosis Society.

examinations has been from 95 to 100 per cent. Both the tuberculin test and x-ray inspection of the chest are used as screens. A mobile x-ray unit is taken to the plants and each employee receives a tuberculin test when he comes to the bus for his photofluorogram. Within the next 72 hours a nurse from the tuberculosis society goes to the desks and machines of the workers to inspect the tests, thus conserving their time. All who present x-ray shadows are examined to determine the etiology of the disease. The goal is accuracy in diagnosis and proper disposition of cases of tuberculosis rather than speed. Sight is not lost of the educational opportunity through follow-up work on the tuberculin reactors.

It is claimed that the decline of tuberculosis in the United States has been accelerated by our high standard of living. It should help greatly to have interest aroused through tuberculin tests, and through teaching reactors what is meant by good nutrition, decent housing and sufficient rest. Our Anti-Tuberculosis Society follow-up nurses do just that.

2. *Case Finding and the Free Tuberculosis Clinic.* This clinic, located in the City Hall, is under the control of the City Health Department but supported partly by County funds. Clinics are held three times a week. The central location makes the clinic easily accessible and they are as free as our public schools. While schools defend us from ignorance, such a clinical service defends us from disease. Although the high school and industrial programs seek cases through the survey method among apparently well people, all suspicious cases are sent to the tuberculosis clinic for final disposition. Contacts of known cases and people with symptoms attend this health center regularly. Discharged sanatorium patients use it for follow-up examinations. About 3,500 examinations are made here annually by doctors of the sanatorium staff. Nursing services in the clinic are by nurses from the Bureau of Public Health Nursing. Follow-up is by this group for City cases and by the Kent County Health Department in the suburbs and rural areas. We feel that by this follow-up, many breakdowns are prevented.

In the conduct of the tuberculosis clinic, personalities again enter into the picture. The Director of the Grand Rapids Bureau of Public Health Nursing* was with the local Anti-Tuberculosis Society for nine years where she became well acquainted with the problems of the tuberculous individual. Her interest in such persons makes for excellent co-operation in the tuberculosis program.

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*Mrs. Mary Otterbein, Supervisor, Bureau of Public Health Nursing, City of Grand Rapids.

The Grand Rapids tuberculosis program is fortunate in having Mrs. Otterbein in her present position.

Hours are distributed around the day so that most everyone may visit the clinic without too much disruption of his daily routine. Anyone may come to the clinic without appointment and no one is turned away if he comes within the clinic hours.

One of the large factors in the success of this program is the cooperation of all groups involved. The medical men willingly and anxiously refer patients to the tuberculosis clinic which is set up to follow through a case—a task which is long and tedious at times. A report and any recommendations that the clinic doctor may make is always sent to the physician who refers the patient. A case may call for frequent filming, gastric lavage with culture and guinea pig inoculation, blood study or any other laboratory procedure helpful in differential diagnosis. All laboratory work is done by the Western branch of the Michigan State Laboratory. Drs. Kendrick and Eldering and an excellent staff of about 30 handle all tests accurately and swiftly. This facility plays no small part in the success of our program.

The Clinic maintains a full time secretary. All cases admitted are checked back to see if their record is in the active or discharged file. Many times a record is present when the clinic patient did not even know it. Some of these records are from childhood and of open air school days. The address is checked. A full history is taken of new patients. At subsequent visits, temperature, pulse and weight are recorded. The doctor at the clinic takes a brief clinical history and if a tuberculin reaction has been obtained before, an x-ray film of the chest is ordered. The patient is sent to the sanatorium where a chest roentgenogram is taken and interpreted and a report sent back to the clinic. The patient returns to the clinic for his report, and any recommendations deemed necessary. If the chest x-ray film is satisfactory, the patient is requested to return in one year. If he does not return, a nurse from the Public Health Nursing Bureau visits him and sees that he reports. If the patient is to return within six months, a dated appointment slip is given him.

If no tuberculin test had been done previously or if we are in doubt as to the outcome of any previous one, we do a Mantoux test first with 0.1 mg. O.T. and then if that is negative, 1 mg. is used. This requires 3 visits by a great many, but very few objections are made. We do not wish to give up the tuberculin test as we feel it is a diagnostic aid and also an educational procedure.

As much time is given to any patient as is necessary. Many require 10 to 15 minutes, but 1 or 2 minutes suffices for most cases. No other chest examination is conducted since tuberculin testing,

sputum testing and x-ray inspection give the information desired.

Bedside service is provided by the Community Health Service (our visiting nurses) for those who, for some reason or other, have remained in their homes. Because of recent nurse and help shortages in the sanatorium, this problem has been increased. This group uses its key position in many homes to spot suspects and refer them to their physicians or the clinic. A state law allows a court order to be filed to keep an active case isolated in a sanatorium. Occasional use is made of this law.

3. *Contacts:* These are checked in two ways. Those contacts of the clinic patients are checked by nurses from our respective Health Departments. In the school program of the tuberculosis society the procedure is reversed. Here the nurse starts with the infected student and tries to find the source of infection.

4. *Treatment and Sunshine Sanatorium.* The Kent County Tuberculosis Sanatorium (Sunshine Sanatorium) conducts the therapy program for the cases found in the community. The first case admitted to the Sanatorium (a tent) was in 1916. The death rate for Grand Rapids that year was 102.1 per 100,000 population. There was one death in the Sanatorium that year and 130 outside. In 1920 an established Sanatorium was opened. That year there were 55 admissions and 14 deaths. There were 105 deaths outside the Sanatorium. In 1923 the present buildings were opened when 131 cases were admitted to the Sanatorium. There were 29 deaths in the Sanatorium and 73 elsewhere in the city. In 1929 there were 170 admissions to the Sanatorium and 37 deaths; 51 persons died outside the Sanatorium. In 1930 there were 158 admissions and 36 deaths. Only 22 deaths occured outside the Sanatorium. Increased percentage of deaths in Sanatorium is contagion control. In 1944, the year of the low death rate, there were 115 Sanatorium admissions and 19 deaths in the Sanatorium. Only 7 persons died outside of the Sanatorium. These years were picked out because of certain happenings in the program (Table 1). Each year a greater percentage of the deaths from tuberculosis took place in the Sanatorium.

This indicates that the people are using the Sanatorium to better advantage. Was that because the doctors of the community recognized the Sanatorium as a place for tuberculosis? Or was it because the clinic and the tuberculosis program were working more efficiently? Or was it because of the educational program of the Anti-Tuberculosis Society? The tuberculosis death rate is falling in all of Michigan. In the lower peninsula it is lower than in the rest of the State. Table 2 shows the comparison between Grand Rapids death rate and the rest of lower Michigan.

It is interesting to note that the percentage of admissions to

the Sanatorium of far advanced or minimal cases has not varied appreciably over the past ten years regardless of all the emphasis put on early diagnosis. Neither has the percentage of discharges as deaths and apparently arrested changed appreciably since 1937. However many cases of minimal tuberculosis have been watched outside the Sanatorium through the clinic. In Grand Rapids the chief function of the Sanatorium has been to isolate active cases. In Michigan, the University groups have been active in the tuberculosis program. Many of the recommendations for treatment in the local Sanatorium have been under their supervision.

5. *Follow-up* of actual cases and their families is also handled by nurses from the Health Departments. The nurses from the Bureau of Public Health Nursing attempt to find all contacts of any new active case that is found. These contacts are urged to come to the clinic. A subsequent visit is made to the home every six months to check on any changes in the health of the contact. When an open case is left in the home, a nurse visits and in-

TABLE 2

Year	Tuberculosis Deaths in Grand Rapids	Tuberculosis Deaths in Sanatorium	Death Rate Grand Rapids	Death Rate for Lower Michigan, Less Wayne County (Detroit)	Death Rate for All of Michigan
1916	131	1	102.1		
1917	146	0	109.9		
1918	162	2	122.2		
1919	111	3	82.1		
1920	124	19	90.1		
1921	106	19	75.0		
1922	86	17	59.7		
1923	102	29	69.8		
1924	101	31	68.1		
1925	98	39	63.8		
1926	83	41	53.2		
1927	84	41	51.9		
1928	80	44	48.7		
1929	88	37	52.3		
1930	58	36	34.3		
1931	66	44	38.4		
1932	57	32	32.7		
1933	64	32	36.2		
1934	56	22	31.7		
1935	57	31	32.4		
1936	41	31	23.3	27.31	41.34
1937	38	29	21.6	26.96	41.61
1938	35	30	19.9	23.90	36.59
1939	33	25	18.8	22.60	36.88
1940	31	26	18.9	20.78	33.33
1941	26	25	15.8	26.64	31.69
1942	31	18	18.9	19.36	33.51
1943	29	26	17.7	20.53	32.51
1944	26	19	15.8	18.32	32.51
1945	32	24	19.5	19.17	32.35

structs in isolation technique. Definite instruction is given as to patient and family routine. The policy of the Tuberculosis Society in its survey program provides for at least one subsequent x-ray inspection within two years for all tuberculin reactors. Would they really do a better job of prevention if these reactors were followed over a longer period? At least more cases would be discovered before they become infectious, which is now a big problem among sanatorium admissions. Most of them have already sown the seeds for more tuberculosis before they were discovered and isolated.

6. *Rehabilitation* has depended upon a local office of our State Department of Vocational Rehabilitation. Social problems are being referred to the local Family Service Association. However, the community recognizes the need for occupational therapy and a complete rehabilitation program in the sanatorium, and funds have been provided for this. A suitable professional worker is being sought.

The Kent County Medical Society and local Parent-Teacher Associations play important roles in this program. The medical group has worked with us through the Medical Committee of the Tuberculosis Society and Tuberculosis Committee of the Medical Society. The Parent-Teacher workers have folded Christmas Seals and prepared 50,000 letters for mailing during the seal campaigns since 1927. They have taken this as an annual obligation besides cooperating in the conduct of health institutes each year.

Future Program. We can never be satisfied with what has gone before. Constant planning for the future is needed. The easiest part of the program is behind us. To further reduce the death rate will require a more vigorous uncover program to find those chronic cases without symptoms who keep tuberculosis alive in a community.

It behooves us to have adequate facilities for care of this type of case. We must plan for sheltered and isolated work for these cases. They should not be locked up with nothing to do. Many of these cases can produce wealth if given the opportunity.

We must strive to make the recovered tuberculous self-supporting when possible. This part of the work is the least efficient in all tuberculosis programs. Industry must be brought into this project. The recovered tuberculous has learned how to take care of himself. He makes a good employee. He has less lay-offs and is usually steadier in his employment than the average worker. Should not tuberculosis be considered a compensable disease?

SUMMARY

If death rates prove anything, it may be interesting to note that our rate declined from 103 per 100,000 population in 1905, when

the tuberculosis society was organized, to 52.3 in 1929. This shows a 50 per cent decrease in 24 years. From 52.3 in 1929 it dropped to 15.8 in 1944, a startling decrease of 70 per cent in only 15 years.

These things have been factors in this picture:

In 1923, our new Sunshine Sanatorium was opened. Modern approved tuberculosis treatment began at this time. The first pneumothorax was given in 1921 and thoracoplasties started about the same time.

In 1925, proceeds from our Annual Sale of Christmas Seals was returned to this county and education was greatly stimulated.

In 1929, tuberculin tests and x-ray examinations were started in our high schools and colleges and opened many doors for educational and preventive services.

Our free clinics were operated all during the depression years and at no time did the County Medical Society or any other organization exert pressure to have them closed.

RESUMEN

Si los coeficientes de mortalidad sirven para algo, será de interés anotar que nuestro coeficiente bajó de 103 por 100,000 habitantes en 1905, cuando se organizó la Sociedad de Tuberculosis, a 52.3 en 1929. Esto demuestra una disminución del 50 por ciento en 24 años. De 52.3 en 1929, el coeficiente bajó a 15.8 en 1944, una disminución asombrosa del 70 por ciento en sólo 15 años.

Los siguientes factores han contribuído a que se obtengan estos resultados:

En 1923 se inauguró nuestro nuevo Sanatorio Sunshine. Se comenzó entonces el tratamiento moderno de la tuberculosis. Se aplicó el primer neumotórax en 1921 y se comenzaron a hacer toracoplastias más o menos al mismo tiempo.

En 1925 el producto de nuestra Venta Anual de Sellos de Navidad fue reintegrado a este Condado y se pudo así estimular mucho la instrucción pública en relación con esta enfermedad.

En 1929 se iniciaron las pruebas tuberculínicas y los exámenes radiográficos en nuestras escuelas secundarias y universidades y esto le abrió las puertas a los servicios educativos y preventivos correspondientes.

Nuestras clínicas gratuitas funcionaron durante todos los años de la depresión económica, y ni la Sociedad Médica del Condado ni ninguna otra organización influyó nunca para cerrarlas.

All the information for this paper was obtained from Mrs. deKoning and Mrs. Otterbein, and I wish to give credit to them and to those of the Sanatorium staff who have helped to collect statistics to be included above. Without their help the information could not have been assembled.

Penicillin in Acute Suppurations of the Lung

DONATO G. ALARCON, M.D., F.C.C.P.
Mexico City, Mexico

Acute suppurations of the lung have been always one of the hardest problems which the specialist is called to confront due to the peculiar circumstances of the condition.

Drainage of the abscesses through the bronchus, when its patency is maintained, has been the hope for a spontaneous healing in all cases and in this expectancy, several weeks and months usually elapsed thus delaying surgical intervention which is always feared as very hazardous.

The use of some measures such as postural drainage, intravenous injections of several substances as sodium bonzoate, ethyl alcohol, creosote derivatives, vaccination, arsenical compounds, etc., were considered justified until recently and a number of healings were attributed to every one of the procedures tried, although most of these measures could not resist the test of a critical study. Most probably the good results of some drugs should be credited to spontaneous healing through bronchial drainage.

When the group of sulfa drugs appeared, renewed hopes led to the trial of these drugs in pulmonary abscesses and after some experience was gathered the consensus of the specialists was not entirely favorable and the surgical approach, which calls for the artificial drainage of every purulent collection, held its position. Therefore, a large number of suppurations were surgically treated once reasonable time had been given to test the effectiveness of the sulfa drugs.

With the advent of penicillin, again all of us started trying the new drug for these suppurations, with the hope of avoiding surgical treatment and its risks. The early experience with penicillin, however, was not very satisfactory, for those who reported the first results from the use of the drug according to the pattern employed for other diseases.

Again, the principle of draining any collections of pus was holding its position and most of the early observers advised not to delay the operation. Particularly, there were reported failures when dealing with abscesses caused by anaerobic germs of the fetid type. Little hope was left for the use of penicillin in this

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group of suppurations in which nevertheless no one failed to employ penicillin, more or less skeptically.

This condensed communication deals with the shortest description of a small series of lung abscesses treated with penicillin since this drug has been available. It is noteworthy at once that the number of cases coming to the specialist since the advent of penicillin is much less numerous than used to be, and this seems to indicate that the popular use of the drug has diminished the incidence of pulmonary suppurations in a very large degree.

The other point which I intend to stress is that since penicillin has been available, very few acute lung abscesses have reached the surgical stage, as most of them resolve before surgery is imperative. I may state that among the last ten cases seen by the writer in the last two years, only one was operated on account of pleural complication of the abscess and none has undergone the usual thoracotomy. This situation is strikingly different from that of a few years ago, when about fifty per cent of the lung abscesses needed surgical treatment, around the second month.

Due to the short time alloted to this presentation, I will make a brief description of eight cases. At the end, I shall try to draw some suggestions for the treatment of these suppurations from this experience which being limited as yet, force us to adopt a different attitude toward these conditions, than we did years ago.

CASE REPORTS

The first case is that of a boy who developed a lung abscess and pneumoccocus empyema in April 1944, and was seen as illustrated in Figure 1. The blood picture was characteristic: Leucocytes: 23,300, neutrophiles 82 per cent; typical fever; sputum: pneumoccocus and no tubercle bacilli.

He was treated with sulfapyridine and sulfamerazine but did not improve and before I saw him, 900,000 units of penicillin were given intramuscularly during a week. Then, I suggested the use of local instillation of penicillin into the cavity through the bronchoscope. It was done and spectacular success was obtained immediately .The fever subsided at once, the leucocytes diminished in number in less than a week and the cavity decreased as is seen in Figures 2, 3 and 4.

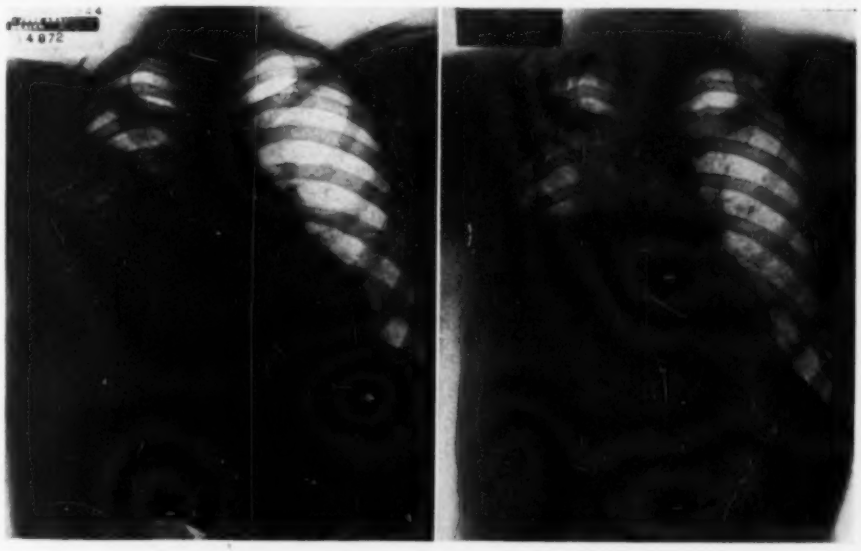
In this case we did not doubt that the success was due to the bronchoscopic use of penicillin although we did not give the procedure full credit because it was the first one.

The second case was that of a lady, 45 years of age, suffering from a definite suppuration of the lung of the fetid type. The sputum was abundant and very foul, the condition very critical, leucocytes over 20,000, and the x-ray film showed a large cavity (Figure 5).

The patient demanded very eagerly to be operated on, because she was coughing continually. Penicillin had been used by her doctor in rather large amounts intramuscularly, for over a week, and no signs of improvement were noticed. Rather, she seemed to become worse every day. However, I suggested the bronchoscopic application of penicillin, though I

remained ready to operate in the next days. The improvement was extremely gratifying. In a few weeks she became well, as can be seen in Figures 6 and 7.

The third case is that of a man of 35 who was under treatment on account of some erroneous diagnosis of typhoid fever and later discovered to suffer from empyema (Figure 8). Pneumoccocus, streptoccocus and fuso-spirochetal organisms were found in the pus of the empyema. A catheter was introduced without allowing air to enter; then the pleural cavity was washed and penicillin was left in the pleural space at short intervals. Also, penicillin was used intramuscularly. When he improved



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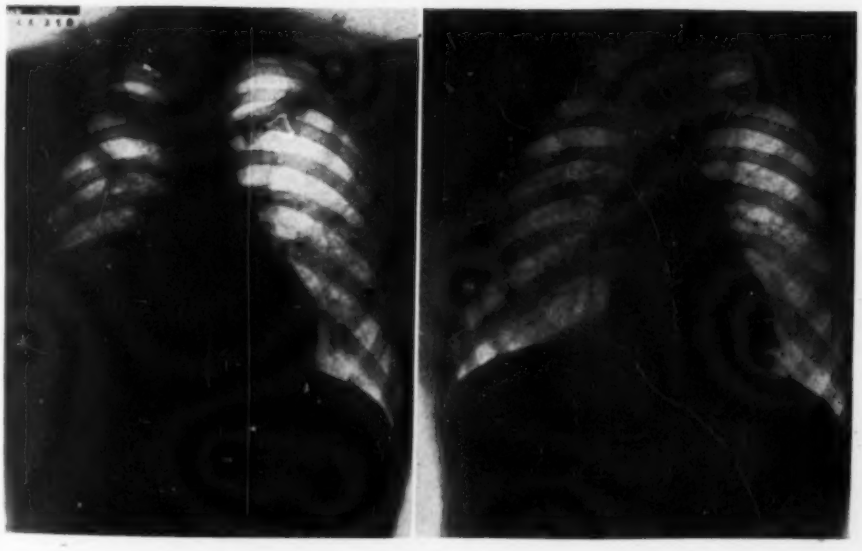

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and became ambulatory and penicillin was discontinued, he developed a lung abscess, as may be seen in Figure 9. The condition became very serious. Bronchoscopy was done and penicillin instilled into the right bronchus, and an immediate improvement was seen. A few instillations

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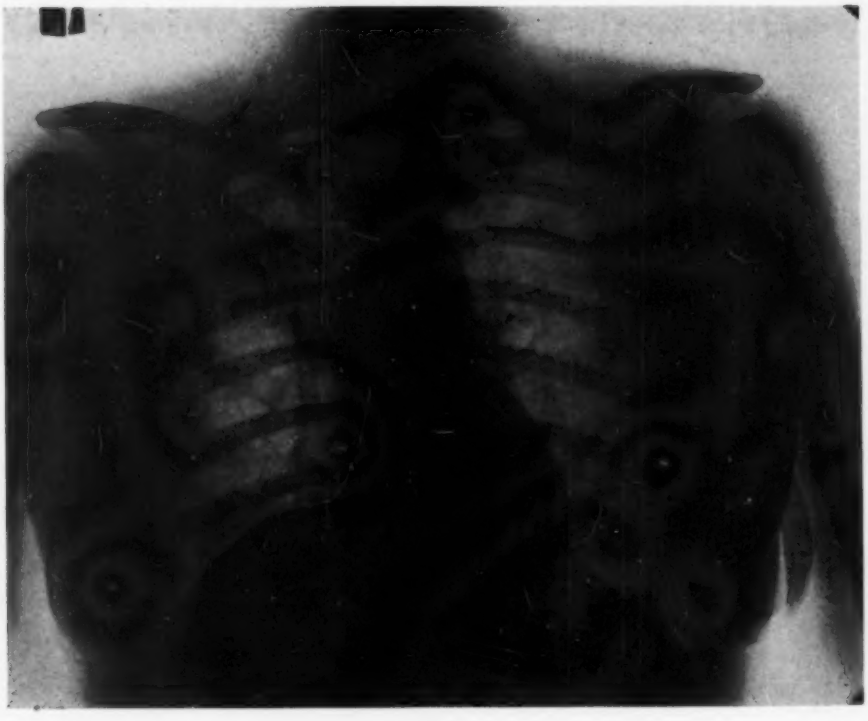

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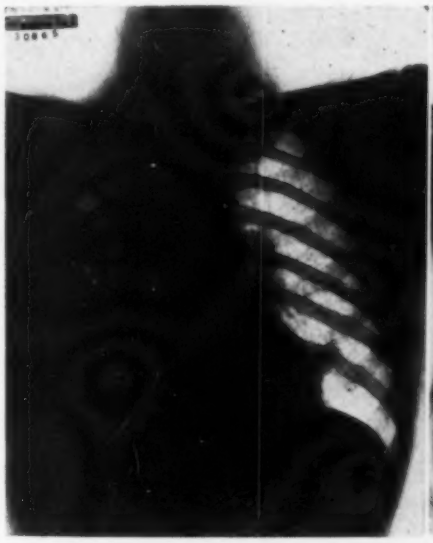
into the trachea after the bronchoscopy were done and he recovered completely (Figure 10).

The fourth case is of a man, aged 46 years, who had some respiratory condition seemingly benign at first but his physicians became alarmed when he developed dyspnoea and had foul expectoration. The x-ray film showed a round infiltration, and although the condition was admitedly serious, was treated with sulfadiazine (Figure 11). In a few days he became rapidly worse and suddenly developed severe dispnoea, cyanosis, high temperature and tachycardia. Then a new film was taken and a pyopneumothorax was diagnosed. The pus obtained by tapping was very



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fetid, and contained staphyloccocus, streptoccocus, fuso-spirochetal organisms and several other germs not identified (Figures 12 and 13).

The patient was operated upon in a very critical condition; a pleurotomy was performed, leaving a couple of tubes high on the back because the lung was adherent at the lower lobe. The film shows the approach and the result of the drainage (Figure 14).

Before the operation, the patient had several vomicas and during the operation, the opening of the bronchus into the pleura was confirmed. Through the tubes, penicillin was injected three times a day and a striking improvement was seen. In about ten days, the closing of the bronchial fistula was noticed and large washings of the pleural cavity

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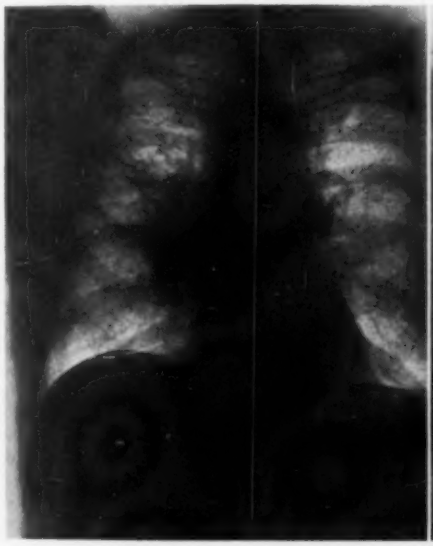
were feasible, leaving at the end of the washings, some penicillin solution. After about 40 days, he left the hospital and has been well for over a year thereafter.

The fifth case, that of a man of 75 years of age, is worthy of description: He was at a hospital, unconscious for a week, under treatment with penicillin in regular doses, and with the diagnosis of lung abscess already established. Figure 15 shows the Roentgen ray aspects. Bronchoscopy was suggested with leaving penicillin in the cavity, if possible. This was done twice without discontinuing the intramuscular injections. Within a week he recovered consciousness and improved in an unex-



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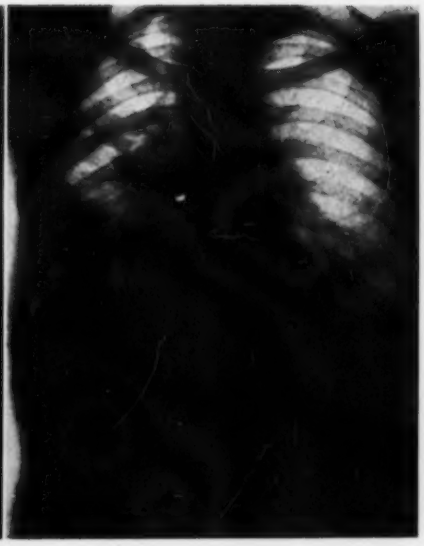

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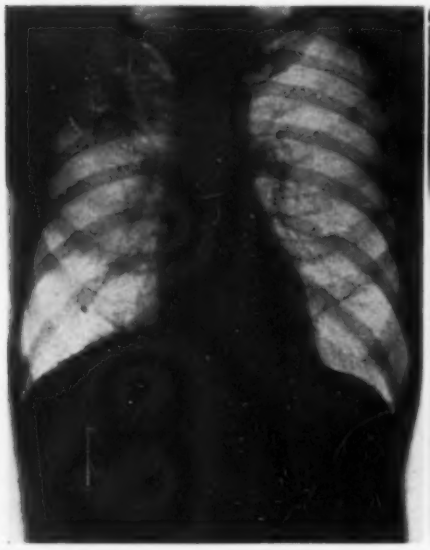
pected way. He became completely well in 40 days and resumed his normal life (Figure 16).

Three more cases can be summarized as follows:

One is that of a man 65 years old, with a definite suppuration of the lung clinically, bacteriologically and roentgenollogically.

Figure 17 shows his condition. He improved under the treatment described but relapsed soon to improve twice more under the same treatment. On account of this circumstance, carcinoma of the lung was suspected and puncture-biopsy done which confirmed the diagnosis. He died after a pulmonary hemorrhage (Figures 18 and 19).



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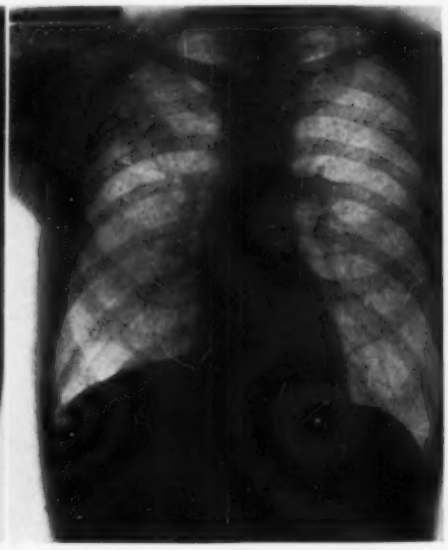

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The seventh case is one of lung abscess following a duodenal operation. He was under penicillin treatment given intramuscularly, one million units already having been administered. I advised to proceed with treatment outlined above and he healed completely after four weeks (Figures 20 and 21).

The last case is one of acute suppuration with atelectasis, leucocytosis of 19,000, fever, anemia and other toxic and local symptoms. Another specialist did bronchoscopy and diagnosed carcinoma, although the biopsy was negative (Figure 22). Treated with penicillin for over one month. The shadows seen on the first film disappeared and the patient recovered completely (Figure 23).

From this short series of cases we shall try to draw some suggestions concerning the treatment of pulmonary suppurations by means of penicillin.

1. The use of penicillin should be continued for as long as necessary to obtain a definite improvement clinically as well as hematologically. This protracted use of penicillin must go beyond the average for other acute diseases before it is considered a failure.

2. The improvement as ascertained by Roentgen rays is much less rapid than the clinical and hematological ones. Under penicillin treatment the cavities become sterile, we believe, before they close, as far as the combined clinical, hematological and x-ray films can show.

3. When an immediate response to the intramuscular penicillin is not seen, the use of the bronchoscopic approach to the purulent focus is imperative.

4. In these cases, as described, credit should not be given to bronchoscopy alone but to the combined use of penicillin intramuscularly and bronchoscopically. Earlier experience with the bronchoscope alone failed to give as good results as the combination of these two methods.

RESUMEN

La evacuación del contenido de los abscesos pulmonares ha sido el mecanismo natural que tiende hacia la curación del proceso supurante. Esta evacuación espontánea y constante a través de un bronquio permeable no es sin embargo el hecho corriente en la evolución de los abscesos pulmonares y el esperar que la canalización espontánea conduzca a la curación es a menudo peligroso.

El empleo de medios médicos como las drogas diversas, vacunación, o de medios mecánicos auxiliares como la canalización postural se consideraban justificados en la espera previa a cualquiera determinación quirúrgica y a esos medios se atribuía a menudo el éxito satisfactorio que más bien se debía a la tendencia espontánea a la curación.

Aún al aparecer las Sulfonamidas se obtuvo un número de cura-

ciones atribuibles a su uso, muy bajo en relación con lo que se esperaba.

La Penicilina hizo a su vez esperar mejores resultados, pero se empezaron a referir resultados poco convincentes sobre todo tratándose de las supuraciones de anaerobios.

Es interesante notar que desde que la Penicilina se ha popularizado el número de abscesos que llegan al especialista se ha reducido de modo considerable, lo que debe atribuirse a que esas supuraciones son tratadas con precocidad y de hecho son dominadas antes de llegar a la etapa abscedal.

Antes del advenimiento de la Penicilina, cuando menos la mitad de los casos de absceso-pulmonar tenían que ser operados por los medios habituales en la etapa subaguda.

Hoy es excepcional la intervención de ese género.

Se presentan ocho casos de absceso pulmonar tratados por la Penicilina, en los que se pusieron en juego los recursos habituales antes de instituir el tratamiento por ese antibiótico.

Se usaron las sulfonamidas al principio. Sobre todo por la escasez de Penicilina, se usó ésta por vía intramuscular y en todos los casos salvo uno, se recurrió a la aplicación de la droga por medio del broncoscopio una o varias veces, depositando la solución dentro del absceso y obteniéndose a partir de esa aplicación una definida mejoría, que en la mayoría no se había logrado por el uso de la Penicilina sola por vía intramuscular a dosis suficientes.

El único caso en que no se obtuvo resultado favorable de este procedimiento, fué el de un cáncer supurado, comprobado por punción-biopsia.

Las conclusiones a que llega el autor:

1. El uso de la Penicilina en las supuraciones pulmonares debe ser tan prolongado como sea necesario para obtener la mejoría radiológica, clínica y hematológica de manera definida. Esta prolongación del uso de la Penicilina debe llegar mucho más lejos de lo aconsejado en otras enfermedades agudas antes de declarar su ineficacia.

2. La mejoría que puede verse a los rayos X es mucho menos rápida que la clínica y la hematológica. Bajo tratamiento con Penicilina creemos que las cavidades se esterilizan relativamente antes de ser clausuradas anatómicamente.

3. Cuando no se obtiene una respuesta favorable inmediata al uso de la Penicilina intramuscular, debe emplearse la aplicación de Penicilina in situ por el broncoscopio.

4. No puede atribuirse sólo al uso del broncoscopio la mejoría notada en esta pequeña serie de casos, porque la experiencia anterior no demuestra una constancia de resultados favorables por uso solo, como la aquí referida.

Treatment of Spontaneous Pneumothorax*

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Spontaneous pneumothorax, its etiology, pathogenesis and treatment present interesting problems in pathological physiology and clinical practice. Pneumothorax is either of exogenous or endogenous origin.[1] In exogenous pneumothorax, air enters the pleural space through an opening in the chest wall and parietal pleura. It is caused by trauma or more frequently by a therapeutic procedure (induced pneumothorax). Endogenous pneumothorax results from leakage of air from the lung or the mediastinum into the pleural space. It may arise as a result of trauma, disease, congenital or acquired defect of the lung or pleura, or a combination of these factors. Since spontaneous pneumothorax implies a sudden entrance of air into the pleural space as the result of disease or congenital or acquired defect of the lung or air passages, exogenous pneumothorax and endogenous pneumothorax of traumatic origin do not enter into consideration in the present discussion. Cases of extra-pulmonary origin and cases resulting from tuberculous infection, pulmonary abscess, or infarct are also excluded; under these circumstances the therapeutic problem differs from that of the remainder of the group. It may be mentioned in passing that some varieties of traumatic pneumothorax by violence not involving penetration of the chest wall (blast injuries) and pneumothorax arising from certain therapeutic procedures (bronchoscopy, intra-tracheal anaesthesia, tracheotomy) have somewhat the same pathogenesis as spontaneous pneumothorax. A classification of pneumothorax is suggested in the table below:

Exogenous
- Induced Pneumothorax
  - Therapeutic
  - Diagnostic
- Induced Pneumoperitoneum
- Trauma by external violence

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With penetration of chest wall (stab and bullet wounds)*

Endogenous

Traumatic

External violence

Without penetration of chest wall (blast injuries, fractured ribs)

Therapeutic procedures

Bronchoscopy

Esophagoscopy

Intra-tracheal anaesthesia

Tracheotomy

Needling of the lung

Resuscitation (Violent artificial respiration; excessive positive pressure from mechanical resuscitators)

Non-traumatic (spontaneous pneumothorax)

Pulmonary

Pneumonia (primary or secondary)

Atelectasis (caused by obstruction of a bronchus by intrinsic or extrinsic growth, foreign body, or plugs secondary to infection, etc.)

Pulmonary emphysema

Bronchial asthma

Silicosis

Tuberculosis

Abscess or gangrene of the lung

Neoplasm of the lung

Pulmonary infarct

Subpleural vesicles: congenital and acquired subpleural cysts, emphysematous vesicles, scar tissue vesicles, congenital or acquired weakness of alveolar wall and/or pleura

Infection of the pleural cavity with gas-forming bacteria

Extra-pulmonary

Perforation of the oesophagus

Perforation of the trachea or the main bronchus

Perforation of the stomach or the intestine

What is the mechanism of production of spontaneous pneumothorax of such diverse etiology? There are no doubt several mechanisms involved, depending on the circumstances under which pneumothorax develops. With ulceration of a progressive lesion of tuberculosis, pulmonary abscess or neoplasm into the pleural space, there results a fistulous opening which is rather large and which does not close on expiration (an open type of pneumothorax which from a simple type may quickly evolve into a pyopneumothorax). The pathogenesis of pneumothorax under such conditions is quite obvious. However, the mechanism involved in other diseases, such as pneumonia, bronchial asthma, etc., or in apparently healthy individuals is debatable. There are several possible modes of production of pneumothorax in these various

*Here the endogenous factor may also be present, air entering the pleural space from pulmonary alveoli ruptured by the penetrating object.

conditions. The usually accepted theory is that a subpleural bleb, induced by straining, coughing, or other forms of violent activity (parturition, heavy lifting) ruptures into the pleural space. The bleb may arise in a number of ways. It may represent a blown out vesicle of emphysema arising as a result of involvement of a greater or smaller portion of the lung in some pathological process. In bronchopneumonia small abscesses of the bronchiolar wall may become necrotic, and their rupture or that of the alveoli may lead to interstitial emphysema. Coughing or straining would force air through such an opening, which dissecting along the septa would produce subpleural blebs.[2] The rupture of small subpleural blebs has been considered as an etiological factor of spontaneous pneumothorax occurring in healthy people. Thus it has been customary to ascribe the escape of air from the lung into the pleural space to rupture of an emphysematous bulla or perhaps to minute tears produced by the tug of adhesions. However, it has been frequently impossible to demonstrate the existence of these changes either roentgenologically or by direct inspection. Even if these conditions are responsible for spontaneous pneumothorax in some cases, they cannot explain it in all instances.

It has been noted that spontaneous pneumothorax is frequently associated with mediastinal and interstitial emphysema. Thus during the influenza epidemic of 1918-1919, Berkley and Coffen[3] reviewed 1701 cases of bronchopneumonia, in which series 9 patients developed extensive subcutaneous and interstitial emphysema. Of these 9 patients 2 had an associated spontaneous pneumothorax.

Some twenty years later Hamman[4] expressed an opinion that "....one is justified in considering that the pneumothorax may be secondary to mediastinal emphysema." Elsewhere,[5] discussing spontaneous pneumothorax, he stated: "It seems altogether likely that in most instances, if not in all, the air reaches the pleural cavity through the mediastinum. I think that we must now at least entertain the possibility that the initial lesion of a spontaneous pneumothorax may be interstitial emphysema of the lung with an escape of air to the pleura through the mediastinum." Several features in some of the reported cases of spontaneous pneumothorax support Hamman's contention. Also, reports on subcutaneous emphysema of the neck associated with spontaneous pneumothorax in asthmatics[6] suggest the possibility of mediastinal pathways for air.

Pastorino[7] also suspected the existence of bronchovascular pathways for air through the mediastinum. It remained for Macklin[8,9] to demonstrate that such pathways actually exist. By introducing air under pressure into the terminal bronchi of experi-

mental animals and following its course histologically, he succeeded in demonstrating a break through the walls of the overdistended alveoli of the lung into the adjacent perivascular sheaths overlying the finer ramification of the pulmonary blood vessels. Once entrance has been gained to the perivascular sheaths, air can travel toward the hilum of the lung to the mediastinum and from there, by rupture through the pleura, into the pleural space. It can also travel from the mediastinum to the tissues of the neck, producing subcutaneous emphysema, or even to the retroperitoneal space. The possibility exists that the air may proceed in the opposite direction and lodge beneath the visceral pleura. The mediastinal pleura may be more resistent than the visceral pleura. Subpleural air-vesicles therefore are more likely to rupture and afford exit to air than is the mediastinal pleura. However, the pressure gradients carry most of the air, if not all of it, toward the hilum of the lung.

An attempt has been made by the Macklins[10] to introduce a common denominator in the pathogenesis of pneumothorax arising under many diverse conditions. The reader interested in this problem is referred to a recent paper by these authors[11] presenting a most comprehensive digest of the subject. Briefly the explanation is as follows: Pulmonary alveoli are of the two types: (a) those which have their bases lying between other alveoli and (b) those with the bases resting against some structure other than adjoining alveoli. The latter class, with bases abutting upon bronchi, bronchioles, blood vessels, connective tissue, septa or pleura, is alone concerned in the production of pulmonary interstitial emphysema, and its sequelae (pneumomediastinum, pneumothorax, subcutaneous emphysema). As pores exist between the alveoli of the first type ("pores of Kohn"), air can pass from one alveolus to the adjoining one. But whenever air escapes from the base of the second type of alveolus, it can make its way only into one place, the underlying connective tissue. This constitutes the first step in the production of pulmonary interstitial emphysema, and later pneumomediastinum. Rupture of "marginal" alveoli is possible under the following circumstances: (a) Overdistension of the alveoli, without corresponding expansion of the lumen of the pulmonary vessels, permitting the establishment of a pressure gradient from the alveolus to the vascular sheath; (b) The same gradient may be created by reduction in caliber of pulmonary vessels; (c) Increased intra-alveolar pressure. Experimentally the Macklins demonstrated that the break-through is not only in the alveoli under the pleura, but also in alveoli throughout the depths of the lung, wherever they lie around the blood vessels.

The first of the above mentioned conditions (a), overdistension of the alveoli, occurs with overexpansion of some part of the lung as a phenomenon in connection with partial bronchial or bronchiolar obstruction through neoplasm, foreign body, or in pneumonia, silicosis, tuberculosis, measles and other infectious diseases. Similarly, the end result is identical in cases of general overinflation of the lung, as in insufflation anesthesia, postoperatively and in resuscitation, with the use of excessive positive pressure from mechanical resuscitators. In these circumstances factor (a) operates in combination with factor (c), i.e., increased intra-alveolar pressure.

The second set of conditions (b) is fulfilled in cases of pulmonary embolism. In combination with increased intrapulmonary pressure it occurs in parturition, violent straining, violent cough, asthma, blowing of wind instruments and blowing against resistance in general.

Factor (c), i.e., increased intra-alveolar pressure, usually occurs in association with over-inflation (Factor a) or reduction in vessel caliber (Factor b).

When spontaneous pneumothorax occurs in the train of events as above described, air may be demonstrated roentgenologically in the form of streaks along the vascular channels in the lung; air in the interstitial space between the pleural folds and the pericardium along the left border of the heart appears as a rather sharply defined translucent band outlining the course of the pericardial sac, especially along the upper part of its left border. In the lateral view air streaks may be seen in the anterior mediastinum between the cardiac silhouette and the chest wall. However, demonstration of air by x-ray studies in these locations may be difficult. Hamman[5] described a physical sign in patients with pneumomediastinum. It is apparently due to churning of air in the mediastinum by the impact of cardiac action: over the precordium a crunching, churning or bubbling sound can be heard synchronous with cardiac systole. Even if not present at the time when the patient with spontaneous pneumothorax first presents himself for observation, a history of such an event may be elicited on careful questioning, for the sound may be audible to the patient himself. This is exemplified in the following abstract from the history of a patient observed by one of us (E.R.M.):

A 48 year old newspaper man stated that he had been in good health prior to the onset of his present illness, except for pneumonia in 1943. Since January of 1944 the patient had been serving as Assistant Sergeant at Arms for the State Legislature. His duties involved carrying rather heavy stacks of books of bills weighing between thirty to forty pounds. About two to three weeks prior to the onset of the attack to be described

below, he developed a slight cough productive of small amounts of white phlegm. About a week later, one night following a hard day's work, he suddenly heard a peculiar crunching sound in the right upper chest. This sound continued off and on for about a week or two and although causing him no discomfort it puzzled him a great deal. He felt quite well otherwise and had no other symptoms until the 11th of June, when at about 4:00 P. M. while walking down the street on his way home from work he suddenly was seized with a severe, sharp, knife-like pain in the right infraclavicular region, extending down the right side of the thorax to the costal margin, lasting about two or three minutes. At the same time he experienced a tearing sensation inside of the right side of the chest. This was soon followed by marked breathlessness. Although the sharp knife-like pain disappeared, some pain on inspiration continued for one and one-half to two hours. Because of marked breathlessness and discomfort he was able to take only a few steps at a time but finally managed to get home. A roentgenogram taken by a private physician demonstrated a pneumothorax on the right side with a partial collapse of the lung. A week later this finding was corroborated on admission into the hospital.

When spontaneous pneumothorax arises in the course of pulmonary interstitial emphysema and pneumomediastinum, gas pressure built up in the mediastinum, largely as the result of coughing and straining, may impede the return flow of blood to the heart through low pressure venous channels, resulting in embarrassment of circulation. This, with the splinting of the lung by air along the perivascular sheath, may greatly enhance the already existing respiratory embarrassment caused by the pneumothorax through collapse of the lung and the shift of the mediastinum toward the unaffected side.[11]

Although the explanation given by the Macklins probably holds in a number of cases of spontaneous pneumothorax, as in individuals in whom no abnormality of the lungs can be demonstrated, and the source remains unknown even on autopsy,[12,13] there is no doubt that the older explanation of a "primary" rupture of a subpleural bleb still is true to fact in many instances, as proven by roentgenological studies [14a,b,c,d] and direct observation on thoracoscopy.[14c,d] There are undoubtedly many instances of spontaneous pneumothorax complicating pulmonary disease which pass unnoticed. For example, as remarked in a previous communication by one of us,[15] spontaneous pneumothorax complicating pneumonia may be masked by other grave symptoms of the underlying pneumonic process and thus not constitute a dramatic or distinct episode in the course of a serious illness. For this reason this complication is not recognized more frequently. With more extensive roentgenological studies in different chest conditions it may be found to occur much oftener than noted heretofore.

The course of spontaneous pneumothorax, particularly in the

apparently healthy, is usually benign, afebrile, and without exudate. There is a definite tendency to spontaneous recovery in 2 to 6 weeks, the duration being roughly proportional, in the absence of complicating factors, to the extent of the pneumothorax. However, complications do occur, the most frequent of these being recurrence which takes place in 20 to 45 per cent of cases.[15,16,17] Trudeau[18] reported a patient who had had spontaneous pneumothorax 12 times on the left side and 16 times on the right. Tension pneumothorax with mediastinal shift is reported in about 10 per cent of the cases.[15] This is a serious complication which is brought about by the action of a valve mechanism allowing air to enter but not leave the pleural space until a positive pressure has been attained, necessitating emergency treatment. The operation of such valve-like mechanism need not necessarily imply the presence of a traditional fistulous opening which presumably opens with inspiration and closes on expiration. When spontaneous pneumothorax arises as a result of pneumomediastinum, air leaks through the rent in the mediastinal pleura into the pleural space but cannot travel in the opposite direction. Occasionally spontaneous haemopneumothorax may occur when blood vessels are severed in the process of tearing of a pleural adhesion or rupture of a bulla.

Air in the pleural cavity does not always reabsorb; the pneumothorax may persist or become chronic. The condition may persist for months or even years. Perry reports a patient with a lung still collapsed after 20 years.[19] Another case of 30 years' duration has been reported.[20] In these instances there apparently exists a pleuro-pulmonary fistula which is prevented from closing perhaps by adhesions: diaphragmatic movements transmit traction through the collapsed lung by means of adhesions to the diaphragm on the one hand and adhesions to the chest wall on the other. The patient, otherwise in good health, may remain handicapped by cardiac and respiratory embarrassment, which he may suffer even on slight exertion.

Spontaneous pneumothorax may not require active therapy; it may disappear by itself in a comparatively short time without much distress or inconvenience to the patient, particularly if he curtails his activities for the duration of pulmonary collapse. However, in cases of recurrent, chronic or tension pneumothorax, intervention may be indicated. Even in some instances of pneumothorax of comparatively short duration, such intervention may be necessary if the patient is under considerable distress from the combined effects of pulmonary collapse and underlying pulmonary disease. Thus a severe asthmatic already laboring under marked respiratory embarrassment of continued and unrelieved

bronchospasm may not be able to withstand long the added burden of pneumothorax. Seven deaths from spontaneous pneumothorax complicating bronchial asthma have ben reported.[21-25]

Although in simple pneumothorax the lung re-expands promptly, air may be aspirated from the pleural space at short intervals to hasten re-expansion of the lung. Aspiration of air must be undertaken cautiously, with withdrawal of small amounts of air (200 to 500 cc.) at one sitting, to avoid high negative pressure which may be conducive to enlargement of the original opening into the pleural space or its persistence.[1] In recurrent pneumothorax aspiration of air is best avoided lest the leak persist or become larger. Instead, the induction and maintenance for several weeks of a low grade positive pressure pneumothorax by injecting air instead of withdrawing it may be indicated, to encourage the closure of a pleuro-pulmonary fistula. If this procedure fails in the case of recurrent pneumothorax, other measures may be tried, provided the patient is not greatly inconvenienced by the episodes of pulmonary collapse, in which instance no interference of any sort is necessary.

The production of an aseptic or "chemical" pleuritis has been tried in the hope of producing adequate and persistent adhesions between lung and pleura, sufficient to prevent repeated collapse of the lung. The substance most frequently employed is hypertonic glucose solution, 30 to 67 per cent.[26,27,28] This idea first occurred to Spengler in 1901 and has been used since by a number of workers.[29] Spengler also suggested the use of a 0.5 per cent solution of silver nitrate.[29] Other materials have been employed, among them the patient's blood,[30] guaiacol and iodoform,[31] iodized oil,[28] and a host of other substances, some of them tried only experimentally such as lipiodol, mineral oil, India ink. Particulate matter, such as plain or iodized talc, powdered or in suspension, has been used for the same purpose. Intrapleural blood clot and fibrin are usually deposited on the costal pleura, less so on the diaphragmatic pleura. The parietal pleura is usually thickened, whereas the visceral leaf is rarely much changed. Hypertonic glucose solutions cause effusions but not adhesions.

Unfortunately chemical instillations are often painful and not infrequently accompanied by constitutional symptoms with or without pleural effusion. Neither are they universally successful. Injection of the patient's blood is not an unmixed blessing. It may lead to the organization of heavy deposits of fibrin on the visceral pleura preventing re-expansion of the lung. The risks of constrictive visceral pleuritis with encasement of the lung may be minimized when the above procedures are carried out only after the lung has already partially re-expanded, being not far away from

the chest wall, and when the remaining air is rapidly and immediately aspirated following the injection. It is essential with this form of treatment to get the parietal and visceral layers of pleura in contact at the earliest possible moment.[1] Alexander[32] considers the injection of irritating chemicals into the pleural space as useless, uncertain or dangerous.

Poudrage was introduced by Bethune[33] in 1935. This method consists in blowing iodized talc powder by means of a special blower, into a closed pneumothorax, under thoracoscopic guidance. It has been used with success a number of times. However, there are serious objections to this procedure. It places irremovable particulate matter within the pleural space and may cause severe pleuritis resulting in such thickening of the visceral pleura as to make re-expansion of the lung altogether impossible, thus defeating the original purpose. Ross and Fullerton[34] have found at autopsy that the pleura after treatment with poudrage was the site of a formidable foreign body reaction about 1 cm. in thickness.

Besides introduction of foreign material into the pleural space, other methods consist of scarification of pleural surfaces, temporary phrenic nerve paralysis, severance of adhesions and excision of the bulla. Scarification of the parietal pleura or rubbing the pleural surfaces with gauze have been tried, but without too much success.

In persistent or recurrent pneumothorax closure of the pleuropulmonary fistula may be prevented by adhesions. Diaphragmatic respiratory movements transmitting traction through the collapsed lung by means of adhesions to the diaphragm and chest wall may keep the opening patent. In that case phrenic nerve paralysis or severance of adhesions at thoracoscopy or thoracotomy may be helpful.

Surgical closure of the tear responsible for the leak or excision of the offending bleb or bulla constitute the most radical and at the same time a more difficult operative procedure. The number of cases so treated is small. Such surgical approach is justifiable under certain circumstances in case of recurrent or persistent pneumothorax, particularly of the tension type. In favor of resection of the lesion itself is the more certain cure of the condition although recurrence is still possible. Also, pleural adhesions can be obtained with more certainty by rubbing the pleural surfaces with gauze and re-expanding the lung at the close of operation. Bigger[35] has reported one case in which he resected an offending bleb discovered upon exploration of the chest for the site of a bronchopleural fistula. Churchill[36] explored the pleural cavity in search of a valve vesicle, but was unable to locate the site of the fistula. Instead, he roughened the pleura

with gauze with good results. Sycamore[14c] reported the radiographic appearance of a bleb, substantiated by thoracoscopy and later resected. Tyson and Crandall[37] reported a patient with recurrent tension pneumothorax. In this case cautery pneumonolysis was done first. With the next recurrence, an emphysematous bleb visualized by roentgenography, and measuring approximately 5 cm. in diameter, was excised. A follow-up over a period of three years and seven months revealed an uneventful course, without recurrence, the patient working as a clerk in a grocery store. Surgical intervention for persistent spontaneous pneumothorax was deemed advisable in two patients who came under our observation. The added serious handicap of an underlying pulmonary condition made such intervention imperative. Large emphysematous bullae are usually situated in the upper lobes; when the whole lobe is emphysematous it may be easier to perform a formal lobectomy rather than to attempt suture or excision of a single bulla. Sutures do not hold in such frail emphysematous tissues. The death of our second patient (Mr. E. K., Case 2) might have been prevented had a lobectomy been done instead of suture of the emphysematous portion of the upper lobe.

Case 1: M. M., 37 year old white American male, had his first admission into the hospital on July 31, 1943. He gave a history of bronchial asthma of 10 years' duration and as a reason for present admission marked increase in dyspnea and chest pain since the 13th of July. On entry the patient was seen to be a well developed, but somewhat undernourished man with sallow complexion and in moderate respiratory distress. The positive findings were limited to the chest with characteristic expiratory rhonchi scattered over both lung fields. The percussion note was hyperresonant over a portion of the left lung field and the breath sounds were markedly diminished over the same area. Blood pressure 136/90. Pulse 104. The urinalysis was not remarkable. The total leucocyte count was 10,400 with 9 per cent eosinophils. The Wassermann reaction of the blood was negative. The roentgenogram of the chest revealed a pneumothorax on the left side with moderate compression of the lung from the apex to the base and a small amount of pleural effusion obscuring the left costophrenic angle. The course in the hospital was afebrile and rather uneventful. In a month, the lung completely reexpanded and the patient was discharged from the hospital on the 3rd of September.

The second admission was on the 25th of December, 1944, at which time he stated that 5 weeks prior to entry he again developed marked breathlessness with chest pain. On entry the patient was seen to be in marked respiratory distress. The physical findings were the same as on previous admission except that at this time the hyperresonance on percussion with markedly diminished or totally absent breath sounds was found over the entire left lung field. The leucocyte count was 14,600. The roentgenogram of the chest showed a left pneumothorax with a practically total collapse of the lung and displacement of mediastinum to the opposite side. The manometric reading was plus 2,

plus 6, indicating that this was a tension pneumothorax. No evidence of acid-fast infection was found on inoculation of a guinea-pig with the patient's sputum. Patient's condition remained unchanged, with low grade fever, and continued marked respiratory distress. The lung remained totally collapsed when finally, after 5 week's stay in the hospital, a decision was made to operate. On the 6th of February operation was done by one of us (L. E.) under satisfactory ether anesthesia administered through an intratracheal tube. Anterior incision through the 3rd intercostal space with infraction of the 4th rib gave sufficient access. Immediately upon opening the chest one could see what looked like a rent in the anterior surface of the upper lobe. This was oval in shape, measuring about 1cm. by ½ cm. and in its base a meshwork of fibers could be seen. It looked like a typical ruptured emphysematous bulla. It was difficult to assert this with certainty because the defect was on the front of the lung lying on its upper surface. Therefore it was impossible to submerge it in water and so demonstrate that it bubbled. However, the chest was filled with water and no other bubbling focus could be visualized. The above mentioned defect was sewed over first with a cross-stitch of catgut and when air was seen to escape from the stitch-holes it was again grasped with a sponge-stick and this in turn was surrounded with another catgut ligature. Positive pressure was stopped in order to see whether the lung would collapse. One could not see the upper lobe with certainty but the lower lobe, even when the pressure was removed remained at least 50 per cent distended, thus demonstrating an obstructive type of emphysema. Both visceral and parietal pleurae were about 1 mm. in thickness. The lung was brought out to the surface of the pleura, where, re-inflating it, the remaining air bubble was displaced by salt solution and the chest was closed except for a catheter which was led off under water in order to insure against subcutaneous emphysema. After being brought to bed the man was much less cyanotic and breathed easily. No air escaped from the catheter.

Following return to the ward, the patient's condition remained good. There was considerable relief from dyspnea with a corresponding increase in his well being. The postoperative course was essentially uneventful and a roentgenogram of the chest taken two days following surgery revealed the left lung to be completely re-expanded. On the third postoperative day the catheter was removed. The patient developed considerable cough and sputum with numerous scattered rhonchi but this cleared and on the 7th postoperative day he was allowed out of bed. He was kept under observation for two more weeks; the lung remained re-expanded and he was discharged to his home. Ten months after discharge from the hospital there had been no recurrence of his pneumothorax.

Case II: E. K., 47 year old white American male, was admitted into the hospital on the 25th of January, 1945. He stated he had enjoyed excellent health in the past and, except for a slight "cigarette cough" in the mornings, had been asymptomatic. A few days before the New Year he had become wet in the rain. He did not take cold, however, but on the day after New Year's, upon walking to the carline, he suddenly became dyspneic. Apparently the breathlessness was severe enough to force him to return to his home rather than go to work. A diagnosis was not made. The patient remained in bed more or less since the onset of his present illness and noted marked shortness of

breath upon very slight exertion such as getting in and out of bed and going to the bathroom. There was no previous history of dyspnea with exertion, ankle edema, hypertension or rheumatic fever and he denied chest pain, hemoptysis, fever or sweats. There was no history of weight loss.

On entry, the patient was seen to be a fairly well developed but rather poorly nourished man, slightly dyspneic. The essential physical findings were limited to the chest with hyper-resonance on percussion over both lung fields, being more marked on the right where the breath sounds were totally absent. Blood pressure 120/95. Pulse 108. He had a low grade fever. The red cell count was within normal limits, the total white cell count was 20,000 with 70 per cent polymorphonuclear leucocytes. The blood test for syphilis was negative. The roentgenogram of the chest revealed a pneumothorax on the right with a practically total collapse of the lung and slight displacement of the mediastinum to the opposite side. The initial manometric reading was plus 1, minus 1, and plus 1, minus 4, upon aspiration of air. No acid-fast organisms were grown on culture of the sputum. With the failure of the lung to re-expand it was decided to operate. The operation was performed by one of us (L. E.) on the 19th of February. A needle introduced into the second interspace anteriorly with the man recumbent on his back measured an intrapleural pressure of plus 3, plus 1. Upon sniffing against a closed glottis a maximum negative pressure of minus 4 was registered. The chest was opened in the third interspace. Access was poor, on which account the third rib was transected in the anterior axillary line. One could then see in the right upper lobe a mass of huge emphysematous bullae, the largest about the size of a hen's egg. At the junction of two of these bullae air streamed out from a small hole about 2 mm. in diameter. This was easily seen on filling the chest with water. An attempt was made with a sponge-stick to grasp the region of the small opening, surrounding the sponge-stick with a ligature. In so doing further tears of the above mentioned bullae resulted and were controlled only after a number of the bullae were grasped and drawn up into two chromic catgut ligatures which gathered the whole apical region into their knot. A number of adhesions between the upper lobe and the chest wall were severed for the purpose of applying this ligature and a portion of the lung distal to the ligature was resected. After the leak in the upper lobe had been secured an attempt was made to inflate the lower lobe under strongly positive pressure. However, pressure of 20 cm. of water applied for some ten or fifteen minutes failed to succeed in inflating the lower lobe which remained as a gray, flabby, carnified structure at the bottom of the right chest. Failure to expand this lobe was probably due to an unclosed air leak elsewhere. A catheter was introduced through about the 6th or 7th interspace in the axillary line and led out under water. The patient who was anesthetized with a single dose of 1 gram of pentothal did not breathe spontaneously. On bronchoscopy some frothy secretion was aspirated from the right lower lobe but scarcely enough to explain either the collapse of this lobe or the absence of respiration. Finally, with the aid of coramine, oxygen and other stimulants, shallow respiration was induced and maintained under an oxygen tent. The wound was closed and a pressure dressing applied.

Following surgery, because of the shallow respirations, the patient

was kept in the oxygen tent. Respiration gradually improved and the following day the tent was removed; the patient breathed without difficulty and gave no evidence of cyanosis. On the first postoperative day subcutaneous emphysema developed involving the face and neck. A small flat sandbag was placed over the operative area. However, the subcutaneous emphysema increased and spread to involve the shoulders and upper arms and even the scrotum. A rubber drainage tube was inserted into the incision under the skin and suction applied. In spite of this the emphysema increased; the rubber drain was removed and a large bore needle was replaced. At 9:00 P. M. on the second postoperative night in spite of the marked emphysema his breathing was not labored and the patient was comfortable and in good spirits. Three hours later he suddenly became cyanotic and expired. Permission for autopsy could not be secured. A roentgenogram of the chest taken on the day of death revealed the right lung to be only partly collapsed.

Comment

In both patients presented, the subpleural emphysematous bullae proved to be the offending lesion. In the patient with bronchial asthma, the pneumothorax was of the tension type. In both instances the collapsed lung failed to show any tendency to reexpand in periods of six and ten weeks respectively. The operation for tension pneumothorax was successful. The lung remained reexpanded when the patient was last seen six months postoperatively. In the other patient exitus followed on the second postoperative day. Malignant interstitial emphysema with widespread infiltration of air through subcutaneous tissues culminated in death, as it always does unless the pressure in the mediastinum is relieved by incision through the jugulum. Unfortunately, in the case under discussion the decision to intervene was not made promptly enough. It would have been better to have proceeded to resect the whole upper lobe rather than to have closed the chest over this unsatisfactorily sutured extensively emphysematous part of the lung. At times the peripheral walls of the bullae give way so extensively that the pleural surface of the lung is converted over an area of several inches into a fine mesh-work of elastic trabeculae which lie closely applied to the surface of the pulmonary pleura. Countless small bronchial fistulae then result. These wide-spread surface ruptures cannot be securely sutured, nor leaks through them effectively closed. Lobes with these changes are better removed in their entirety or sub-totally, the bronchial stump being securely sutured and covered over with pleura or with adjacent normal lung.

Repair or excision of the offending lesion in spontaneous pneumothorax may be technically difficult, and inexact closure fraught with disastrous results. The lesion may be difficult to find and when found is not always amenable to closure or extirpation with

reasonable ease. When this is so, lobectomy should be performed rather than ligature, suture or excision of the peripheral lesion. Therefore, this radical approach is to be resorted to only when the pneumothorax is disabling, repeatedly recurrent or obstinately persistent.

RESUMEN

1. Se presenta una clasificación de neumotorax.

2. Se discute el mecanismo del neumotorax opinándose que el neumotorax espontáneo es debido:
   (a) Al mecanismo conocido, es decir a la perforación de un absceso, de una caverna, etc., al espacio pleural libre.
   (b) A un mecanismo menos conocido en donde una ruptura alveolar o bronquiolar abre los espacios perivasculares del pulmon a la entrada de aire, el que penetra en ellos extendiéndose hacia el hilio y el mediastino, produciendo un enfisema intersticial. Desde el hilio y el mediastino el aire penetra a la pleura. Este mecanismo explica la producción simultánea de un neumotorax y de un enfisema mediastinal.

3. Los alvéolos pulmonares tienen dos formas:
   (a) Una que tiene su base rodeada por otros alvéolos.
   (b) Otra que tiene su base apoyada contra otros elementos pulmonares, así como brónquios, bronquíolos, vasos sanguíneos, pleura, etc.

   Como los alvéolos de la forma (a) están conectados entre si, ésta forma no da origen a un neumotorax intersticial. Con la ruptura de alvéolos de la clase (b), el aire escapa al tejido inter-alveolar produciendo un enfisema intersticial, hilar, y a veces un neumotorax.

4. Se discuten las condiciones y los detalles de este último mecanismo.

5. Se discuten las indicaciones terapeuticas del neumotorax:
   (a) Aspiración.
   (b) Inyección de aire y establecimiento de un neumotorax a presión positiva.
   (c) Inyección intrapleural de varias sustancias capaces de producir una pleuritis aseptica o "química," como suero glucosado hipertónico, sangre, talco, etc.
   (d) Tratamiento quirúrgico por cierre de la fístula, por resección de la parte enfisematosa del pulmon o por lobectomia.

6. Se citan dos casos de neumotorax espontáneo tratados quirurgicamente.

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A Plea for Increased Caution in the Use of Surgical Collapse Therapy for Pulmonary Tuberculosis

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Not many years ago—within the lifetime of some of us—pulmonary tuberculosis was considered an almost hopeless disease. Patients were advised to "go out West and rough it," and those who did recover did it in spite of this advice rather than because of it. Examples of the fatalistic attitude prevalent in those days are too well known to all of you to merit discussion at this time. In 1877, what we consider to be the most significant advance in therapy in the recent history of the disease—the systematized sanatorium rest treatment—was popularized in this country by Trudeau, a few years after having been introduced abroad by Brehmer and Dettweiler.

Artificial pneumothorax, which had been suggested centuries before,[7] was introduced in Milan by Forlanini and about 1900 began to be used in this country. Other means of collapse therapy were introduced in rapid succession.

ARTIFICIAL PNEUMOTHORAX

It has been recommended, and has been, with some, a regular practice, to institute pneumothorax as soon as there is radiographic evidence of any tuberculous pulmonary lesion. While it is obviously better to heal a minor lesion by means of a minor operation than later to arrest a severe lesion by a major operation, we think that operations should be reserved for occasions in which they are indicated, and to us the presence in the lung of an area of increased density compatible with pulmonary tuberculosis is far from being an indication for collapse treatment.

Furthermore, we do not approve of the early institution of artificial pneumothorax in non-cavernous lesions confined to a small part of one lung even if they are undoubtedly tuberculous. Such lesions improve and heal as a rule on sanatorium regimen, and if the patient in years to come has a recurrence of his tuberculosis, the pneumothorax is then available. If the lesions progress or fail to improve on rest in bed, the collapse may then be instituted.

It must also be considered that there are certain dangers inherent in any procedure which involves entering a body cavity. With due precautions illness resulting from artificial pneumothorax is rare and death rarer, but rare as they are, they must be considered when deciding on the type of therapy. Of course, in many cases the dangers to be expected from not collapsing the lung far outweigh those inherent in a pneumothorax. In certain instances, however, there are additional and special dangers to be considered. We agree that pneumothorax should be attempted even though it appears that adhesions between the visceral and parietal pleurae may reasonably be expected to prevent a satisfactory collapse. It is well known that such "expected adhesions" are frequently not present, or are of such nature that intrapleural pneumonolysis may be easily performed. If the adhesions are apparently unsuitable for intrapleural pneumonolysis, we feel that they should, nevertheless, be inspected by means of a thoracoscope, for it is not unusual for an intrapleural pneumonolysis which from x-ray appearance had presented little hope, to be successful.[8] If satisfactory severing of adhesions is seen to be too dangerous, we think that it is, in most cases, even more dangerous to try to stretch the adhesion or tear it from the chest wall by the use of positive pressures. There are various degrees of this danger. If the adhesion is thin and the underlying lung is in fairly good condition, cautious attempts to free or stretch the adhesions are as safe as the nature of the procedure permits. Such adhesions, on the other hand, may be severed with a still greater degree of safety. If the adhesion is thick, sufficient strain on the tissues may tear the pleura and produce a traumatic pneumothorax. This may occur either at the base of the adhesion or at a more distant point. In cases in which the underlying lung is considerably diseased, the application of high positive pressures is exceedingly dangerous. Especially is this true when, as is often the case, the adhesion is over a large or moderately large cavity which is close to the periphery of the lung. The underlying diseased and friable lung may tear and produce the dreaded complication of mixed or tuberculous empyema. Partial cutting of adhesions unsatisfactory for complete lysis, in the expectation that weakening at one point will result in their lengthening or complete separation, has been recommended.[5] We think that this should never be attempted, as the incidence of empyema following this procedure is quite high.[3]

The same principles may be applied to the introduction of air into small pockets. No great good can be expected from the amount of collapse obtainable by such means, and every refill presents grave dangers. We have all seen cases in which the introduction of 50 or 100 cc. of air converted a negative pressure into a highly

positive one. In pneumothorax therapy our objective is to reduce the elastic tension and thereby reduce the strain on the lesion. Certainly 50 cc. of air cannot reduce elastic tension to any great degree, and the production of high positive pressures may lead to catastrophe. In such a case, the pneumothorax should be abandoned and other means of collapse therapy considered if it is deemed indispensable.

The danger of producing injury by the introduction of air under high pressure can be minimized by the use of an apparatus which is incapable of delivering air at high pressures without special adjustment. The type of pneumothorax machine which we have found most satisfactory ordinarily delivers air at a pressure of about twenty centimeters of water, and may be adjusted to deliver it at atmospheric pressure, negative pressure, or high positive pressure. Such a machine is in our opinion the safest type, especially for initial pneumothoraces. Other machines which we have seen in use always deliver the air at a relatively high pressure, the pressure being produced by the use of a pump or by the weight of a column of mercury. These machines make it possible inadvertently to produce pressures which may do irreparable damage.

The advantages of short-bevelled needles in pneumothorax administration are well established, but sharp needles are still too frequently in use. If everyone who used a sharp needle reminded himself as he picked it up that Alexander[2] reported a three inch gash in a lung as the result of the lung's brushing against the tip of a needle, there would soon be few in use. The danger of laceration of the lung is greater at the lower lateral portion of the lung than elsewhere, for the motion of the visceral pleura relative to the chest wall increases from above downward, being relatively small at the apex. Unfortunately the most satisfactory place to introduce a needle is usually near the mid-axillary line.

There are some few types of tuberculosis of the lungs which inherently contraindicate even an attempt at pneumothorax. In acute pneumonic tuberculosis the danger of empyema complicating the pneumothorax is very great.[10] In such a case collapse should not be attempted until the acute process has subsided, and then only if the lesions appear to be amenable to temporary collapse therapy. Likewise, if there is extensive cavitation throughout one lung or huge cavities in any area, attempts at pneumothorax are likely to be without any beneficial effect.

As has already been indicated, we think that after pneumothorax is instituted, adhesions which are attached to the lung in such a way as to interfere with the collapse of cavities should be severed by means of closed intrapleural pneumonolysis if possible. If they are making traction upon a diseased portion of the lung and *there-*

by interfere with satisfactory healing, intrapleural pneumonolysis should be performed. The fact that collapse should be as limited as is compatible with healing should be considered when deciding this.[9] For a time one of us was convinced that all visible adhesions should be cut if their nature permitted it, but we have abandoned this view. We are not unaware that there have been reports indicating that activation of lesions at or near the site of attachment of adhesions sometimes occurs. Whether this happens because the tug of the adhesion prevents complete healing of the lesion, or because the adhesion is evidence of an underlying area of diseased tissue, we are not prepared to state dogmatically; we incline to the latter idea. The question of an adhesion's being detrimental to the ultimate prognosis of an arrested lesion after the lung has been allowed to re-expand seems academic, in view of the fact that multiple adhesions may be expected to form when the visceral and parietal pleurae are allowed to contact one another after pneumothorax is abandoned. Probably most cases of reactivation of apparently arrested lesions are caused by failure to persist in treatment long enough.

Moreover, attempts at pneumonolysis do not always result in an improvement in the anatomical factors affecting the success of pulmonary collapse. We have seen many pneumonolyses performed under what in retrospect seem to us to be rather dubious indications which ultimately resulted in considerably worse conditions than were present before the operation, in some cases so much so that the pneumothorax had to be abandoned. Such un-

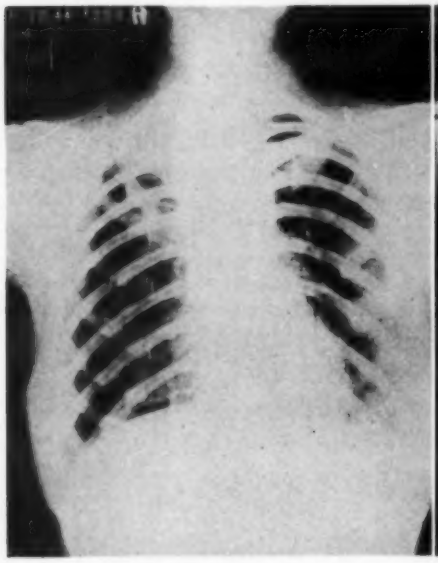

Figure 1

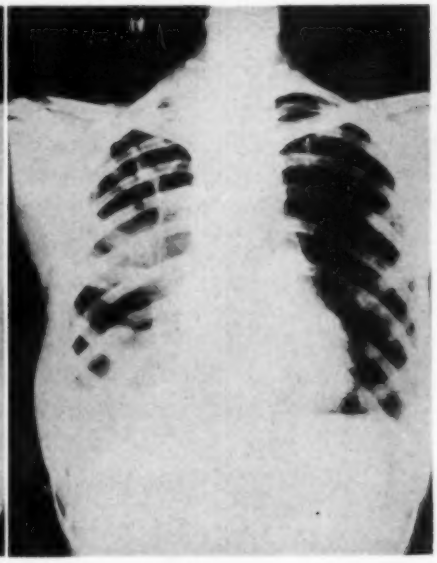

Figure 2

foreseen misfortunes occur also in pneumonolyses performed with the best of indications, but in such cases the probability of benefit outweighs the possibility of harm. On the other hand in cases in which continued improvement might reasonably be expected without the severance of adhesions we believe that the possibility of harm outweighs the possibility of benefit, since complications may occur even when the greatest care is taken to avoid them.

If adhesions interfere with satisfactory collapse in such a manner as to render healing of the lesion unlikely, and cannot safely be severed, other means of obtaining the desired collapse or of augmenting the collapse already present must be considered. Revokable operations naturally come first to our minds.

PHRENIC NERVE INTERRUPTION

Phrenic nerve operations used alone have in our experience shown such meagre results that we have abandoned their use except in very extraordinary cases. The use of phrenic interruption in conjunction with other procedures will be discussed as those procedures are considered.

PNEUMOPERITONEUM

The problem of decreasing the volume of the thoracic cage may also be approached from below rather than from above the diaphragm. The idea of raising the diaphragm by injecting air into the peritoneal cavity is not new but has recently attracted more attention. Some authors have stated that there is less rise of the

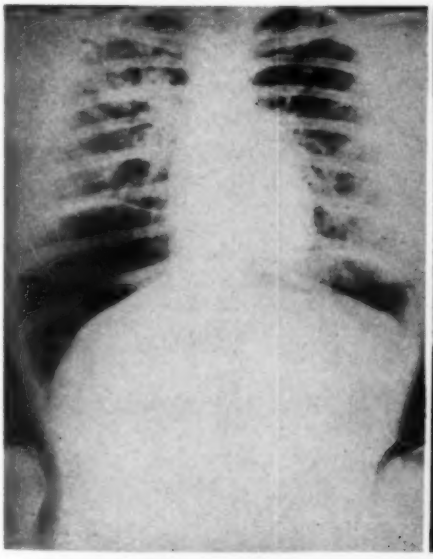

Figure 3

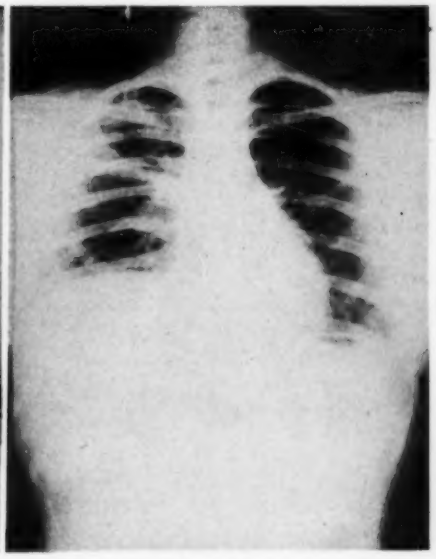

Figure 4

diaphragm when the patient is lying down than when he is sitting or standing. There is, independent of other factors, an increase in residual air which results in a decrease in vital capacity, when the patient assumes the supine position. When he is prone, the residual air is reduced and the vital capacity even less than in the supine position. These changes are the result of changes in the position of the vertebral column, but it may be that their presence has influenced those who advocate the sitting position. If diminution of vital capacity is the end desired, the patient is better off lying down. One of us (W.W.C.) has measured the vital capacity of two patients receiving pneumoperitoneum and found that the vital capacity was 600 cc. greater in the erect than in the supine position in one case and 150 cc. greater in the other. The vital capacity in the erect position in one was 450 cc. less than before pneumoperitoneum was begun, and in the other 100 cc. more. Both of these patients had phrenic nerve interruptions.

1. Before pneumoperitoneum standing ..... 2300 cc.
   After pneumoperitoneum and phrenic standing ..... 2400 cc.
   After pneumoperitoneum and phrenic supine ..... 1800 cc.

2. Before pneumoperitoneum standing ..... 1900 cc.
   After pneumoperitoneum and phrenic standing ..... 1450 cc.
   After pneumoperitoneum and phrenic supine ..... 1300 cc.

If the phrenic nerve is interrupted, there is some rise in the diaphragm. It must be borne in mind that pneumoperitoneum is a procedure which should be done with the greatest caution and care, preferably by one experienced in its use. Its greatest value

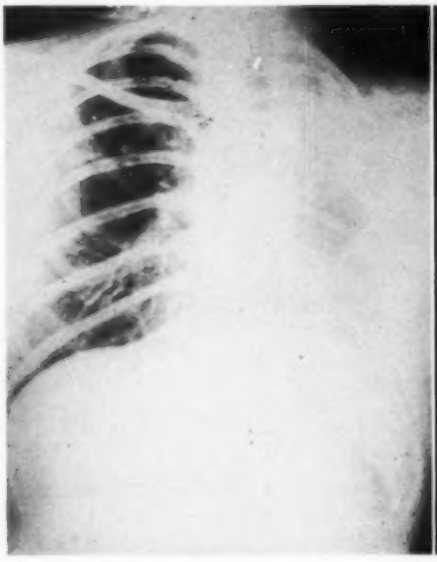

Figure 5

Figure 6

lies in its ability to enhance the diaphragmatic rise following phrenic nerve operation and this may sometimes be done in order to prepare a patient for surgery in less time than would be possible by rest in bed alone.

EXTRAPLEURAL PNEUMONOLYSIS

Extrapleural pneumonolysis, first performed by Tuffier in 1891, has had an extensive trial both in this country and elsewhere. Some of the results have been most discouraging. Sputum conversion is obtained in only about 50 per cent of cases with extrapleural pneumothorax, and complications are numerous and grave.[6,11,12] In several series that have been reported, about one third of the patients developed extrapleural empyema. Of these empyemas approximately two thirds were tuberculous and one third mixed.[6,11,12] Some of the substances used to fill the space have proved unsatisfactory. Although early results from extrapleural pneumothorax are sometimes reasonably good, as the postoperative period increases so also do the complications. Furthermore, extrapleural pneumothorax, although theoretically revokable, actually is in most cases irrevokable, since expansion does not easily occur when refills are discontinued. A thoracoplasty may finally be needed to close the space, and is then more difficult than the usual primary thoracoplasty.[6] The operative risk, the frequency of complications, and the uncertainty of the end results indicate that extrapleural pneumothorax should probably be used only in cases in which the prognosis is very poor without surgery, and other surgical procedures including thoracoplasty cannot be employed. Occasionally an extrapleural pneumothorax may be used to prepare a patient for thoracoplasty. Alarcon[1] has recently published a rather enthusiastic article concerning extrapleural pneumothorax.

THORACOPLASTY

Properly performed thoracoplasty is, in suitable cases, one of the most useful operations in our armamentarium. Reports of good results from bilateral thoracoplasty are not at all rare, and we have had the good fortune to see some of our own patients benefited by it. Innumerable persons owe their lives to unilateral thoracoplasty.

The excellence of the operation should not lead us to disregard contraindications or prescribe its use too freely. We must remember that it is a dangerous and mutilating operation, so much so that patients not infrequently refuse it because of the deformity produced. Improvement in surgical methods has reduced the disfigurement, but it is still enough to be most unwelcome to the patient,

particularly if a woman. Every effort should be made to avoid the necessity of thoracoplasty, and then if it is finally apparent that cure is impossible without it, we can go ahead with a clear conscience. Too much delay, of course, may be fatal. The moment must be seized. In nearly every fatal case a review of the records will reveal a time when an operation might have been done and the patient cured—but tuberculosis, like the tide, waits for no man.

Once thoracoplasty is decided on we must carefully consider the lesions not only on the side to be operated but also in the contralateral lung. Irreversible surgical collapse in the presence of an unstable lesion in the opposite lung is fraught with hazards; a patient with a large cavity on one side and a thoracoplasty on the other, while not necessarily hopeless, certainly is no welcome sight to most physicians. It is almost always better to delay the operation until the contralateral lesion is stable than to try to cure the opposite lung after the operation. Incidentally, paralyzing the diaphragm on the contralateral side in an effort to hasten healing so that surgery can be performed sooner is likely to turn out quite badly. If an appreciable collapse is expected, there must also be expected a concomitant decrease in vital capacity. If this decrease in vital capacity happens to be enough to make thoracoplasty impracticable, we have removed one contraindication only to substitute another.

Intrabronchial spread of the disease to the contralateral lung or to other portions of the same lung during or after thoracoplasty may occur in spite of all precautions, but much may be done by the internist, surgeon, and anesthetist working as a team to lessen its incidence.[14] The patient should empty his cavities and bronchial tree as well as he can before the operation by means of cough and postural drainage. If preoperative bronchoscopy is to be employed, the bronchi may be aspirated by means of a tube. Preservation of the cough reflex is important. Narcotics and sedatives should therefore be employed sparingly, and the anesthetic be such that the patient reacts quickly. If large amounts of infective material are present in the bronchial tree, coughing is as likely to further the spread as it is to rid the lung of the material, so that the initial step of cleaning out the bronchial tree and cavities is very important. The anesthetist can aid greatly by keeping the bronchial tree as dry as possible throughout the operation. Passive movement should be instituted and active movement encouraged very early.

RESECTION OF PULMONARY TISSUE

Pneumonectomy and lobectomy for pulmonary tuberculosis we have had little experience with. Excepting those who had complete

blockage of a large bronchus by an endobronchial tuberculous lesion, such patients as we have had who might have been benefited by resection of pulmonary tissue seemed curable by less heroic means. Further advances in surgery may well make this the operation of choice in many cases.[4,13] Theoretically it is ideal; the diseased tissue is removed, there is no possibility of a breakdown of the old lesion, and the patient is not disfigured. It has been shown many times that the absence of one lung is compatible with health and longevity. We now think that tension cavities which do not respond to other treatment and tuberculomas which produce positive sputum should be treated by resection if the condition of the contralateral lung is satisfactory. Resection should probably not be used in any case in which another form of treatment is likely to be successful.

OPERATIVE CAVITY DRAINAGE

Cavity drainage by means of the Monaldi operation is in some cases a valuable adjunct to other treatment. We have not had the good fortune with the operation that Monaldi had, nor have we seen such good results in the hands of others. Successful drainage in some of our cases has produced considerable temporary benefit but always had to be supplemented by more permanent procedures, inasmuch as cavities which had apparently closed, promptly reopened when the tube was removed. The dangers of the Monaldi procedure are obvious, but accidents occur less frequently than might be expected. If other procedures are at the time impractical, this operation may be resorted to in an effort to put the patient in shape for further surgery but should not be expected to produce permanent results when used alone.

SUMMARY

Surgical collapse of the diseased lung is an important adjunct to rest and supportive therapy in the treatment of tuberculosis. The excellent results obtained in many cases by means of surgical collapse have, however, led many persons to prescribe its use too freely, or, having successfully collapsed a lung, to fail to continue a regimen of rest and supportive therapy. The success of some methods of collapse (f.i. artificial pneumothorax, thoracoplasty) has perhaps led to excessive use of less desirable methods such as extrapleural pneumothorax.

Whenever surgery is considered in a case of tuberculosis, the following questions must be answered. First, in what way will the patient be benefited by this operation? Second, do the hazards and complications, both immediate and remote, of the operation present a lesser danger than a decision to defer or abandon the

operation? It is readily apparent that no blanket answers to these questions are possible. Each case must be decided on its individual merits. In tuberculosis as in other diseases the potential dangers of any operation must be weighed against the expected benefits. Above all, operations should never be done simply because they are possible, or in an effort to "do *something*". A haphazard approach will subject the patient to consequences which he can survive only with the greatest good luck.

RESUMEN

El colapso quirúrgico del pulmón afectado es un auxiliar importante al reposo y a la terapia sustentante en el tratamiento de la tuberculosis. Los excelentes resultados obtenidos en muchos casos mediante el colapso quirúrgico, sin embargo, han inducido a muchas personas a prescribir muy liberalmente su empleo o, después de haber colapsado eficazmente un pulmón, a no continuar el régimen del reposo y de la terapia sustentante. La eficacia de algunos métodos de colapso (vg. el neumotórax artificial, la toracoplastia) quizás ha conducido al uso excesivo de otros métodos menos deseables, tales como el neumotórax extrapleural.

Cuando quiera que se considere la intervención quirúrgica en un caso de tuberculosis, deben contestarse las preguntas siguientes: Primero: En qué forma beneficiará la operación al paciente? Segundo: Presentan los riesgos y complicaciones de la operación, tanto inmediatos como remotos, un menor peligro que la decisión de aplazar o abandonar la operación? Es claro, evidentemente, que no se les puede dar contestaciones generales a estas preguntas. Debe decidirse cada caso a base de sus méritos individuales. En la tuberculosis, así como en otras enfermedades, deben compararse los peligros potenciales de cualquiera operación con los beneficios esperados. Sobre todo, nunca se debe llevar a cabo una operación simplemente porque es posible su ejecución, o con el fin de "hacer *algo*." Esta actitud aventurada expone al paciente a tales consecuencias que si no pierde la vida es porque tiene muy buena suerte.

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Intrapleural Pneumonolysis*

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Artificial pneumothorax has been and still is the most popular form of collapse therapy in the treatment of pulmonary tuberculosis. There is no doubt that a therapeutic pneumothorax, to be successful, must have effected cavity closure and rendered the patient's sputum negative. All pneumothorax workers should employ the operation of intrapleural pneumonolysis for their patients when the indication arises. By such a procedure a great per cent of the cases with a poor pulmonary collapse will be converted into a satisfactory collapse. Jacobaeus in 1913 devised a method of severing adhesions under direct vision. He utilized two cannulas, inserting through neighboring intercostal spaces one resembling a cystoscope, by means of which the adhesions were brought into direct view, the other providing a means of introducing the galvanocautery (Table I).

From 1934 to 1944 inclusive, 612 patients at the Boston Sanatorium were submitted to thoracoscopy. In 79 of these patients a pneumonolysis was not attempted because it was considered unsuitable and, in all probability, dangerous due to the character of the adhesions. In the remaining 533 patients a total number of 605 pneumonolyses were performed, 442 operations being classified as complete and 163 as incomplete. By complete pneumonlysis we mean the severing of all visible adhesions. By incomplete pneumonolysis we mean a partial division of one or more adhesions or the complete division of a fraction of the total number (Table II).

A single stage operation was performed on 485 patients; two stage operation on 16 patients; three stage operation on 4 patients; 27 patients had bilateral pneumonolysis, and 1 patient had a two stage bilateral pneumonolysis (Table III).

Of the 533 patients receiving a pneumonolysis, 323 were females and 210 were males. The youngest in the group was 17 years old and the oldest 52 years of age. The average age was 25 years. The average duration of pneumothorax prior to pneumonolysis was 12 weeks. The instrument employed in our series of operations was the Coryllos thoracoscope and galvanocautery. All instruments

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should be tested carefully before every operation to make sure that the light bulb, cable connections, and current are in good working order. The position of the patient on the table depends upon the operative approach. In most instances the patient is placed on his sound side with a pillow beneath the shoulders. There should be no hesitation in having the patient sit up or turning the trunk if such positions bring the adhesions into better view. The medication employed was morphine sulfate, gr. ¼, and scopolamine sulphate, gr. 1/150, a half hour before operation. Local novocain anesthesia was used with especial care to infiltrate the parietal pleura.

TABLE I

Statistics on Intrapleural Pneumonolysis

Total Number	*Cases*	*Per Cent*
Thorascopies	612	
Patients having pneumonolysis	533	87
Females having pneumonolysis	323	60
Males having pneumonolysis	210	40
Patients unsuitable for pneumonolysis	79	13
Females unsuitable for pneumonolysis	51	64
Males unsuitable for pneumonolysis	28	36

TABLE II

Type of Operation

Total Number	*No. of Operations*	*Per Cent*
Pneumonolyses	605	
Complete pneumonolyses	442	73
Incomplete pneumonolyses	163	27

TABLE III

Number of Pneumonolyses in Stages

	Cases	*Operations*
Single stage pneumonolysis	485	503
Two stage pneumonolysis	16	32
Three stage pneumonolysis	4	12
Bilateral stage pneumonolysis	27	54
Bilateral two stage pneumonolysis	1	4
TOTAL	533	605

The openings in the chest wall should be made after careful study of the adhesions both by roentgenograms and fluoroscopy. In the great majority of the cases the 2nd intercostal space in the midclavicular line and the 3rd interspace in the mid-axillary line were found suitable for thoracoscopy and pneumonolysis. Pneumonolysis requires a great deal of patience and care. All adhesions should be studied in relation to one another, in relation to lung tissue and important structures. Whenever possible, adhesions were severed near the chest wall. At this point there is less danger of injury to the lung and less tendency to bleeding.

Usually thoracoscopy revealed more adhesions than were seen by roentgenograms. The importance of thoracoscopic examination cannot be overemphasized in pneumothorax cases presenting adhesions. Valuable information is gained in studying the pleural cavity, the character of the adhesions, and the type of pulmonary collapse. If a pneumonolysis is impossible, a useless pneumothorax can be discontinued and another form of collapse instituted.

The character and number of the adhesions in the majority of cases could not be foretold by roentgenograms. Some cases which appeared to be difficult on roentgenographic study presented no trouble whatsoever at time of operation. On the other hand, sometimes patients presenting adhesions which by roentgenograms appeared simple, at time of operation offered more difficulty than expected. In order of frequency, the following types of adhesions were encountered: string, fan, cord, band, funnel and curtain.

At the time of operation the sputum was positive in 75 per cent of the cases with evidence of cavitation. We were able to bring about a negative sputum in 63 per cent of all cases operated upon.

All complications occurring within the first four post-operative weeks as well as those occurring later relating to the operation, have been regarded as attributable to the operation rather than to the coexisting tuberculosis and pneumothorax.

Large intrapleural hemorrhage is a fairly rare but, depending on its source, a most dangerous complication. The loss of a small amount of blood either from trocar wounds or cauterized adhesions has not been regarded as a hemorrhage. In our series we encountered 3 cases of intrapleural hemorrhage, 2 of which required aspiration. The source of the hemorrhage in each case was an intercostal vessel injured by the introduction of the trocar.

A slight degree of subcutaneous emphysema occurs in a fairly good number of cases. The emphysema usually clears up in several days. We encountered marked emphysema in four cases which required on the average of from 10 to 16 days to disappear. In no case was there loss of the pneumothorax space.

Spontaneous pneumothorax should be regarded as a serious com-

plication. In our series three cases developed this condition and despite repeated aspirations two of the cases died within one week.

Loss of pneumothorax space occurred in five cases. They were submitted later to thoracoplasty operation.

Small amounts of fluid which remained stationary at the costophrenic angle or large amounts which covered the diaphragm but disappeared within two or three weeks after the operation, were not considered as complications especially in view of the fact that in most of these cases some fluid was present preoperatively.

It has been our experience that pneumonolysis was not an important factor in the production of pleural effusion. We maintain that purulent fluid and large serous effusions are less frequent following pneumonolysis than in unoperated pneumothoraces with adhesions. Serous effusions were observed in 92 cases or 17.2 per cent.

Tuberculous empyema complicating a pneumonolysis is undoubtedly due to trauma of some pleural or subpleural tuberculous foci. In our series 64 patients or 11.6 per cent developed a purulent effusion.

A mixed tuberculous empyema is a very serious complication and a farily constant sequel to bronchopleural fistula resulting from injury to tuberculous lung tissue. In our series this complication was encountered in 72 patients or 13.5 per cent.

No cases of air-embolism, pleuro-cutaneous fistula, nerve injury or shock were encountered in our series (Table IV).

TABLE IV

Complications in Intrapleural Pneumonolysis

	Cases	*Per Cent*
Total number of cases	533	
Intrapleural hemorrhage	3	.006
Marked subcutaneous emphysema	4	.008
Spontaneous pneumothorax	3	.006
Loss of pneumothorax space	5	.009
Serous effusion	92	17.2
Tuberculous empyema	64	11.6
Mixed tuberculous empyema	72	13.5
Cerebral embolism	0	0
Pleuro-cutaneous fistula	0	0
Nerve injury	0	0
Shock	0	0

Finally, all patients receiving pneumothorax, presenting adhesions should be given the benefit of a thoracoscopic examination and a pneumonolysis if possible. For it is not only useless but dangerous to continue an unsatisfactory pneumothorax. The information gained by an early thoracoscopic examination should be the deciding factor as to whether a pneumothorax should be continued or given up and another type of collapse therapy instituted.

SUMMARY

1. From 1934 to 1944 inclusive, 612 patients at the Boston Sanatorium were submitted to thoracoscopy.

2. In 533 patients a series of 605 pneumonolyses were performed. In 79 cases a pneumonolysis was not attempted because of the character of the adhesions.

3. The Coryllos thoracoscope and galvanocautery was employed in every case.

4. The optimum time for pneumonolysis is 2 to 3 months following induction of pneumothorax.

5. Sputum conversion was effected in 63 per cent of the cases operated upon.

6. The operation is not without danger. The complications are enumerated.

7. Intrapleural pneumonolysis is a highly valuable operation in helping to bring about a satisfactory and effective collapse.

RESUMEN

1. De 1934 a 1944 inclusive, se sometieron a la toracoscopia 612 enfermos del Sanatorio de Boston.

2. Se practicaron 605 neumonolisis en 533 enfermos. En 79 casos no se intentó la neumonolisis debido al carácter de las adherencias.

3. En todos los casos se empleó el toracoscopio y galvanocauterio de Coryllos.

4. El mejor tiempo para la neumonolisis es de 2 a 3 meses después de la iniciación del neumotórax.

5. Se efectuó la conversión del esputo en el 63 por ciento de los casos operados.

6. La operación no es exenta de peligro. Se enumeran las complicaciones.

7. La neumonolisis intrapleural es una operación muy valiosa para ayudar a obtener un colapso satisfactorio y eficaz.

Conservative Management of Hemothorax with Presentation of an Illustrative Case

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The diagnosis of hemothorax may be obvious in case of external injuries, or difficult to detect when concealed. Should the symptoms, physical examination and x-ray suggest a hemothorax, diagnostic aspiration is necessary for confirmation. Early shock is the rule. Anoxia also supervenes early. The shock is caused by local injury and hemorrhage. Early in shock, local pain and nervous factors are significant. Pallor; rapid, shallow breathing; small, rapid pulse; cyanosis, fall of blood pressure; and apathy appear in proportion to the amount and rapidity of the bleeding. With the loss of blood, there is a feeling of faintness, air hunger, rapid heart action, and coldness of the extremities. Blood volume, red blood count, and hemoglobin are reduced. At first the blood pressure is usually well maintained, but later falls. Cyanosis may not be evident, since it depends upon the grams of reduced hemoglobin present.

A sequence of events follows the accumulation of fluid or air in the pleural space. First, there is collapse of the lung on the side of the bleeding. The extent depends upon the presence of adhesions and of the amount of thickening of the pleura. Continuous bleeding builds up pressure, which is exerted against the mediastinum. Unless the mediastinum is firm, it readily shifts to the opposite side and partial collapse of that lung takes place. Local stasis results from pressure upon the great vessels and heart. Since the pulmonary system has a pressure one fifth that of the general circulation, control of bleeding from this source is easier; however, the constant movement of the lung may aggravate the bleeding. A vessel from the systemic circulation tends to bleed more violently because of its higher pressure. With increased intrapleural pressure, there is increasing dyspnea and cough, often with expiratory grunt.

It is known that with gross hemorrhage rales appear on the side opposite the bleeding. This transudation of fluid across the epithelial surface is the result of pressure upon the heart and great vessels, reduced oxygen supply to tissues, and dilution of the blood plasma with reduction in the osmotic pressure. The most significant physical signs associated with accumulation of blood are absent breath sounds and dullness to flatness on per-

cussion. Bronchial breathing, bronchophony and pectoriloquy may be elicitied posteriorly at the base, especially when clotting of the blood has taken place in this area. A shift of the heart and mediastinum appears after considerable accumulation of fluid in the pleural space. Signs of pneumothorax may be present above the level of the blood.

Roentgenograms and fluoroscopy are valuable adjuncts in diagnosis. Examination of the patient in the upright position usually gives more information concerning the amount of fluid present. The contour of the bones should be observed for fractures. Radioopaque foreign bodies should be detected with floroscopy, shift of the heart and mediastinum should be noted, and paradoxical movement of the mediastinum and diaphragm should be observed. Diagnostic aspiration of pleural fluid is usually necessary for confirmation. This should be examined for color, specific gravity, hematocrit and cytology. Bacteriological study includes culture and direct smear. Organisms may be tested for penicillin resistance or susceptibility. The hematocrit is of value in noting the percentage of red blood cells present. Should a check-valve-type bronchopleural fistula be suspected, pneumothorax readings must be observed for rising pressures, so that a tentative diagnosis can be made. With very rapid hemorrhages, the blood may compress the air in the pleural space and raise the intrapleural pressure.

It is essential to discover infection early. Many clinical findings are associated with hemothorax, which ordinarily would be diagnostic of infection. Hemothorax frequently results in moderate elevation of temperature; chills and fever may occur with rapid bleeding; and the white blood count may be markedly elevated. These findings are generally higher in infection than in hemothorax alone. Laboratory examination of a small amount of pleural fluid frequently establishes the presence of infection.

Airplane trips without special precautions can add to the anoxia already present because of the reduced oxygen tension at increasing altitudes, and the expansion of gasses present in the abdomen or chest.

Emergency treatment is first directed toward stopping the hemorrhage. Pressure upon open vessels usually cannot be done. Under suitable conditions, ligation of the bleeding vessel may be necessary to prevent exsanguination. Massive hemorrhages, such as may occur with ruptured aneurysm or severance of a major vessel, occur so rapidly that adequate medical aid cannot be given. When a tear in the parietal pleura is so large that air enters and leaves the pleural space with each breath, adequate oxygenation of the blood in the lung is prevented. The opening must be stopped immediately by any sterile or relatively sterile object present. Fre-

quently a large towel serves the immediate purpose. Should paradoxical respiration occur with multiple rib fractures, fixation with adhesive strapping is essential to immobilize the injured area. After fixation, aspiration of the hemothorax and early use of oxygen is indicated.

Treatment depends upon the gravity of the symptoms. Most cases require only careful observation during the acute stage. Bleeding is generally self limited. With a small amount of bleeding, the patient can generally tolerate the symptoms. The bleeding vessel usually closes over with a blood clot that is firm in three to five days. Rest in bed, warmth, fluids and relief of pain delay or abort the onset of shock. Should symptoms progress, then guarded watching must be abandoned. Supportive treatment includes oxygen, fluids, and transfusion of plasma or blood. Oxygen is of great benefit in relieving the anoxia. It should be used early and with adequate pressure. Intravenous fluids, plasma and blood maintain blood volume. Blood is the most useful in controling the effects of severe bleeding. Autotransfusions of blood may be given cautiously but fresh blood from donors is advisable. The speed with which the intravenous fluids are given depends upon the gravity of the situation. With the use of large amounts of fluid, the venous pressure should be checked and the lungs observed for increasing rales. The electrolytes will frequently increase edema and lead to further difficulty with respiration, while plasma and blood will often decrease the edema. Generally the patient is somewhat short of breath, and elevation of the foot of the bed only leads to further discomfort. Roentgenograms should be taken with a portable machine and repeated as often as are needed to indicate the progress of the effusion. Aspiration to relieve pressure symptoms may be dangerous in that the clot is dislodged by the changed intrapleural pressures and bleeding started anew. However, aspiration must be done when urgent pressure symptoms are present. It is probably better to aspirate all the air first and then, if necessary, the blood, at the rate of 200 to 300 cc. as needed.

The amount of air to be maintained in the pleural space is an individual problem. Blood appears to be a better medium for exerting pressure against vessels than air; however, this is a debatable point. In many cases aspiration of the air is sufficient to control symptoms. Should infection be present, pneumothorax may keep the pleural surfaces apart and favor extension of the infection. If air is injected, it may form a space in the upper pleura, which is often quite difficult to obliterate completely. However, there are many factors in favor of the use of pneumothorax. If the blood is aspirated and air replacement done, smaller amounts of blood will remain for absorption. This could well result in more

rapid expansion of the lung with less fibrotic encasement. If there is a lesion in the lung that will be benefited by the pneumothorax, fluid should be drained and air injected as frequently as necessary. Immediate attention must be given a tension pneumothorax, complicating hemothorax. Air is removed as necessary to relieve symptoms. If two aspirations fail, then the use of closed continuous drainage with water seal is advisable. When there is evidence that the fistula has closed, the needle should be withdrawn. Tension pneumothorax is often accompanied by infection, which requires surgical intervention.

Early prevention of infection is more desirable than later treatment of this complication. Should there be reason to suspect infection, penicillin is immediately started systemically or locally. Sulfa drugs may be used, but penicillin usually is more desirable. Both drugs diffuse into the pleural fluid, but penicillin is effective in the presence of pus. The organisms present in the pleural fluid generally are those of the gram-positive group of streptococci, staphylococci and pneumococci which usually are penicillin susceptible. Some believe that foreign bodies should be removed before infection supervenes, or else left until four or six weeks later, when the infection has quieted or has been controlled.

When the acute phase has subsided, the blood in the pleural space is removed. Blood here tends to remain fluid to a great extent for a period of about three to five days. At this time evacuation must be considered. Usually about 300 cc. may be removed daily with little discomfort to the patient. Sterile technique is essential since blood is generally considered a favorable medium for bacterial growth. With the removal of the blood, there will be shortened time for lung re-expansion and a decreased period of convalescence. The less material left in the pleural space, the less likelihood of a greatly thickened pleura resulting. Should blood reform for long periods, it must be removed as it collects. After the blood is removed, fibrin still clings to the pleural wall. A small amount of blood clot will probably remain. This usually absorbs without difficulty. If a considerable amount of blood clot is present and thick fibria forms, decortiation in four to six weeks may be advisable. This frequently prevents the so-called "thoracic cripple," who has dense scar tissue, retraction of the structures on the side of the scar tissue, decreased expansibility of the lung and frequent pains of varying severity.

Most of our cases have been treated only with careful observation and the results have been quite satisfactory. However, the following illustrates the case in which many maneuvers were necessary to control the acute episode.

CASE REPORT

Miss R.M.D., age 22, received right pneumothorax because of a soft infiltrative lesion in the midportion of the right lung. After thirty days of small refills with air, a selective collapse was present over the lesion. Adhesions at the apex and base were to have been investigated later with a thoracoscope. Blood count relatively normal. Sputum positive.

About eight hours after a refill of 350 cc. of air given without difficulty, and with a final pressure of $-\frac{1}{2}$ -2, the patient complained of slight pain and shortness of breath. Fluoroscopy showed a small amount of fluid in the costo-phrenic angle. Twelve hours later, she noticed some increase in the shortness of breath, discomfort on lying down and increasing pain at the base of her right lung. The temperature was 99, pulse 92, respiration 20. There was some increase of the fluid to a level just covering the diaphragmatic leaf, with no shift of the mediastinum. Since shortness of breath and anxiety were out of all proportion to the findings, 250 cc. of air were withdrawn with an initial pressure of -2 -4 and a final pressure of -2 -5. Some relief of symptoms were immediately noticed. The blood pressure was 110/70.

While conservative therapy was continued, the pulse slowly rose to 110 and respirations increased. She did quite well for the next twelve hours when alarming symptoms developed about a half hour following a bowel movement. The radial pulse could not be detected, and respirations were sixty per minute and shallow. The patient was pale, the blood pressure dropped to 82/60, and the heart rate rose to 160. Three-hundred cc. of air were withdrawn with some relief. The initial pressure was plus 2 -3 and the final -4 -9. One-hundred per cent oxygen inhalation was started. Fluids were given by vein until plasma could be obtained. The cough was slight. Prophylactic use of penicillin was started because the increasing intrapleural pressures suggested bronchopleural fistula, and because the white blood count rose to 25,000. Fifty thousand units of penicillin were placed in the pleural space and 15,000 units were given intramuscularly every three hours. Over the course of treatment 540,000 units were used. Roentgenograms showed increasing fluid. Rales were present at the left base (the side opposite the hemothorax), which had not been there twenty-four hours before. Physical signs in the lower half of the right lung were interesting in that whispered pectoriloquy, bronchophony, bronchial breathing and flatness were present. Above this were the signs of pneumothorax.

A blood count at this time revealed W.B.C. 25,250, R.B.C. 2,950,000, with a hemoglobin of 8.5 grams. Pleural fluid showed a hematocrit of 34 per cent, R.B.C. 3,570,000, W.B.C. 15,700, Hemoglobin of 10 grams, Polymorphonuclears 79 per cent (26 per cent "Stab"), lymphocytes 15 per cent, monocytes 4 per cent and eosinophiles 2 per cent, red blood cells well formed, platelets absent. The red cell count of the pleural fluid was actually higher than that of the peripheral blood. Repeated cultures of the bloody pleural fluid on aerobic media, anaerobic media, and media for tuberculosis, showed no growth.

Following the glucose saline infusions, the pulse rate fell to 140. Respirations decreased to 34 but were somewhat labored. The rales at the left base increased; however, the venous pressure was not increased. Plasma was substituted. After 500 cc. of plasma, the patient felt much better, even though the pulse was 148 and respiration 42. All the air was now withdrawn from the right side. Three blood transfusions of

300 cc., 500 cc. and 500 cc. were given over the next twelve hours with marked relief. Temperature was 100, pulse 120, respirations 56, blood pressure 110/80. The rales present on the left side became considerably less.

Following this, the patient gradually developed signs of increasing intrapleural pressure, namely, a tickling cough and progressively increasing respiratory grunt. With this, rales again appeared on the left side. Increased oxygen pressures were tried but gave no relief. Blood pressure mounted to 140/90. Roentgenograms showed marked increase of the fluid on the right side, with considerable shift of the heart and mediastinum to the left. At this time the blood count was 65,000 white cells, 4,100,000 red cells, 10.6 grams hemoglobin; and repetition of this count in 12 hours gave essentially the same values.

Because of increasing pressure symptoms, 650 cc. of blood were slowly removed from the right side. After the blood was removed, the patient felt much more comfortable. Breathing became normal and the left side rales slowly disappeared. Temperature was 101.2, pulse 128, respiration 32. Whispered pectoriloquy, bronchophony, bronchial breathing and flatness to percussion were present over the entire right side. Calories, protein, fluids and electrolytes were maintained by mouth.

The patient improved steadily. Starting four days later, 200 cc. of blood were withdrawn each day. A total of about 1,000 cc. were removed when a dry tap was secured. Pneumothorax was attempted, but small amounts of air caused rapid pressure changes, so it was abandoned. The blood count at this time was: W.B.C. 18,700, R.B.C. 4,000,000, hemoglobin 12 grams, and remained unchanged for three weeks. At the end of three weeks, roentgenograms showed haziness of the right side with a small amount of pneumothorax present laterally. Temperatures varied from normal to 101, pulse 92, respiration 20.

After five weeks, breath sounds were present on the right side, with slight pectoriloquy and dullness still present at the base posteriorly. Scattered, fine pleural rales were noted over the right side. Coarse rales were heard at the hilus. The patient's general condition was good and her nutrition well maintained. Roentgenograms showed evidence of considerable expansion of the lung and less haziness of the pleural space. The blood count returned to the level found on admission. After four months the lung is almost re-expanded, the tuberculous lesion markedly cleared, the sputum negative and the patient doing well in general.

DISCUSSION

A case of pneumothorax complicated by hemothorax is presented, in which numerous maneuvers were necessary to meet the altered conditions taking place in the chest. First conservative treatment was tried but failed. Penicillin was given locally and systemically to control possible infection. Anemia due to blood loss was combated by replacement of plasma and blood. The rapid onset of shock was met by analgesics, warmth and fluid by vein. Pressure symptoms required frequent aspiration of air and blood in order to keep the intrapleural changes at a minimum. Oxygen was administered to relieve the anoxia caused by the diminished hemoglobin, pressure on the vital mediastinal structures, diminished lung

volume, and edema of the lung. After the acute symptoms had been treated, blood was aspirated from the pleural space to the greatest extent possible. The lung slowly re-expanded, with breath sounds appearing on physical examination and roentgenograms showing evidence of re-expansion and clearing.

Infection was never proven. The rising intrapleural pressures made a tenative diagnosis of bronchopleural fistula valid. However, the increasing pressures may have been due to the compression of the air in the pleural space by the brisk bleeding. The extremely elevated white blood count suggested infection, but could have been secondary to the hemorrhage, or possibly the blood transfusion. Penicillin was used as a prophylactic until the laboratory results could be evaluated. Repeated cultures were negative.

At one time during the acute hemorrhage into the pleural space, the hematocrit and blood count of the hemothorax was actually greater than that of the blood in the veins. A likely explanation of this is that the bleeding had taken place into the pleural space when the blood had a high red cellular content. This red blood corpuscle value was reduced when the body fluids were pulled into the blood stream in an attempt to maintain the blood volume and blood pressure.

CONCLUSION

1. Physiological changes in the intrapleural space with hemothorax must be treated individually and met promptly, if best results are to be secured.

2. Conservative treatment usually suffices in hemothorax, but if symptoms increase, energetic treatment of the shock, anemia, edema and increased pressure are necessary.

3. The use or continuation of pneumothorax depends upon the individual case, but in general, aspiration of the air alone relieves symptoms.

4. Blood should be aspirated to the fullest extent possible after a firm clot is present in the bleeding area. This permits rapid expansion of the lung with maximum return of lung function.

CONCLUSION

1. Las alteraciones fisiológicas intrapleurales ocasionadas por el hemotórax deben ser tratadas individualmente y debe hacérseles frente sin tardanza para que se obtengan los mejores resultados.

2. En casos de hemotórax el tratamiento conservador suele ser suficiente, pero si acrecentan los síntomas es necesario tratar enérgicamente el choque, la anemia, el edema y la hiperpresión.

3. El empleo o la continuación del neumotórax depende del caso

individual; pero, en general, la aspiración del aire alivia los síntomas.

4. Después de que se haya formado un coágulo firme en la parte sangrante debe aspirarse la sangre tan completamente como sea posible. Esto permite la rápida expansión del pulmón y la restitución máxima de la función pulmonar.

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Editorial

COMMUNITY TUBERCULOSIS CONTROL

When we consider tuberculosis control or eradication for an entire nation, we must think of the part to be played by each community. In some places more logical programs are developed than in others. The citizens are willing to spend more time, effort, and money, and therefore they advance much faster than those of other communities. Thus for a time there is unequal accomplishment in the various communities, and therefore it is not until all communities attain the goal that the nation itself has controlled or eradicated the disease. An excellent example is that of tuberculosis control among the cattle of the United States. Although a national program was launched in 1917 and a few counties received the modified accredited rating in 1923, it was not until 1940 that all counties merited this classification, and therefore the entire nation was designated a modified accredited area. Now the final goal—eradication—has been attained in some areas while others are lagging, and therefore eradication for the entire nation cannot be announced until every county has eradicated tuberculosis from the cattle herds.

Workers in human tuberculosis are trailing far behind the veterinarians. Nevertheless with certain modifications of program they are following the same pattern. In some communities where the leaders have had a clear vision of tuberculosis control and the citizens have worked long and arduously, the disease is rapidly coming under control and the workers have already set eradication as their goal.

Among the 92 cities of the United States with 100,000 population or more, Grand Rapids, Michigan, is leading in the tuberculosis control program. In 1905 the mortality rate was 103, and in 1929 it was 52.9 per 100,000 population. In 1944 the mortality rate in this city of 165,000 population had been reduced to 15.9 per 100,000. In 1929, 25 per cent of high school students reacted to tuberculin, but in 1946 this percentage was only 8. This was not due to chance or luck but to a well organized program which has been in effect for many years.

In this issue of *Diseases of the Chest,* Sherwood briefly describes the activities that have led to this accomplishment. In a few sentences he casts aside such unimportant factors as race and nationality of the people, slum areas and large industries and proceeds to the tubercle bacillus as the cause of tuberculosis. Attention is called to the official health department, sanatorium staff, medical

society, anti-tuberculosis society, community health service, and certain state organizations working almost as a unit. No group has attempted to monopolize the program and none has tried to destroy another. Instead of fighting one another, the workers have fought the tubercle bacillus. Fundamentals in tuberculosis control have been used in every step. A sanatorium was provided so contagious cases could be removed from their homes. In 1920, only 14 of the 119 deaths occurred in the sanatorium, whereas in 1944, only 7 persons died outside the sanatorium.

The extreme value of the tuberculin test as a case-finder and as an educational agent was early recognized and is administered to children and adults alike. The necessity of periodic x-ray inspection of the chests of all adult tuberculin reactors was fully appreciated and was employed to the limit of available facilities. Complete examination, including laboratory facilities for both pulmonary and extrathoracic tuberculosis is in practice.

Persons who have overcome clinical tuberculosis are re-examined periodically and a good rehabilitation program is being developed. Best of all, the citizens of Grand Rapids are not satisfied with this splendid accomplishment in tuberculosis control. Eradication is their goal! The remaining 91 cities with populations of 100,000 or more as well as smaller municipalities could profit by careful study and application of the Grand Rapids program.

J. A. M.

"Information Please in Medicine"

As Presented at the Twelfth Annual Meeting of the
AMERICAN COLLEGE OF CHEST PHYSICIANS
San Francisco, California
JUNE 29, 1947

Carl H. Gellenthien, M.D., F.C.C.P., Moderator
Valmora, New Mexico

Panel of Experts:

Medicine:
James J. Waring, M.D., Denver, Colorado

Pathology:
Emil Bogen, M.D., Olive View, California

Bronchoscopy:
Paul C. Samson, M.D., F.C.C.P., Oakland, California

Surgery:
Alton Ochsner, M.D., F.C.C.P., New Orleans, Louisiana

Roentgenology:
Russell H. Morgan, M.D., Baltimore, Maryland

Question: What do you think of the penicillin inhalation treatment of bronchiectasis?

Answer (Dr. Waring): I think the penicillin inhalation treatment of bronchiectasis is helpful. It will not cure the irreversible damage to the bronchi, but it will reduce the quantity of the sputum, frequently stop the foul odor and improve constitutional symptoms. Penicillin inhalations are sometimes irritating to the mouth and throat, but in my experience these side reactions have so far not been sufficiently serious to justify stopping the treatment except in a very few cases. I think the penicillin inhalation gets the patient in better shape for operation. In a word, penicillin inhalation treatment is palliative, sometimes has to be supplemented by intramuscular penicillin. Surgery, that is, lobectomy, is the best cure.

Question: How are the dynamics of circulation affected by extensive thoracoplasty, and what is the clinical significance of hypertension with the development of hypertensive symptoms?

Answer (Dr. Ochsner): The dynamics of the systemic circulation are not affected by extensive thoracoplasty. It has been shown, however, that thoracoplasty and other collapse procedures cause a shunt of the blood out of the collapsed lung into the opposite side. This does not affect the systemic circulation, however. Hypertension is of no significance in a patient who is to undergo thoracoplasty with one exception and that is the individual who has myocardial damage as a result of the hypertension may not be able to withstand a thoracoplasty safely, but hypertension per se is no contraindication and does not influence the indications for thoracoplasty.

Question: Does a tuberculoma represent an active or a healed tuberculous process?

Answer (Dr. Bogen): A tuberculoma may be active, healed, or latent, as it is difficult from x-ray or clinical data in many cases to tell just what the condition is. Many of the solitary, round shadows in the lung regarded as tuberculomas by roentgenologists really represent blocked cavities which may re-open if the obstruction to the bronchus is removed.

Question: What effect does penicillin inhalation have on hemoptyses from severe bronchiectases and lung abscess patients?

Answer (Dr. Waring): Penicillin inhalations will not cure the irreversible damage of bronchiectasis and chronic lung abscess. Surgery is the best cure for severe bronchiectasis and chronic lung abscess and therefore is the best treatment for hemoptyses in these conditions.

Question: Which is the best treatment of adenoma of the bronchus? Bronchoscopic? Pulmonary resection?

Answer (Dr. Samson): In general, the best treatment of the adenoma of the bronchus consists of pulmonary resection of sufficient degree to remove the tumor completely. While it is true that in the past there have been scattered reports of bronchoscopic "cure" of adenomas, this has not happened with sufficient regularity to warrant optimism as a usual means of treatment. Bronchoscopy is, of course, of inestimable value in establishing diagnosis through gross inspection of the tumor and biopsy, and is also of great aid in shrinking or at least removing sufficient amount of the local tumor so that infected secretions dammed up beyond the obstruction may be drained out. This adds considerably to the patient's comfort and, when operation is anticipated, it will make the operation considerably safer. Many of these tumors are somewhat like iceburgs in that the endobronchial portion is considerably smaller than the extrabronchial portion and while some amelioration may be gained by treating these lesions locally through the bronchoscope, cure is another matter. Only resection can safely remove an adenoma. In speaking a word about resection, my personal belief is that no tumor should be left behind. We are ill-advised to do resections of one or two lobes and cut through tumor in attempting to close the bronchus. Since there are an increasing number of reports of at least local metastases from adenomas we must consider that they have a certain maligment potential although it may be very small. Since this is the case I believe it much safer to do a pneumonectomy if necessary in order to remove all the tumor.

Question: What surgical treatment, if any, do you advise for a tuberculous cavity in basal division of a lower lobe, with x-ray signs of old apical contralateral infection?

Answer (Dr. Ochsner): I should prefer doing a phrenicectomy as a preliminary procedure to be followed probably by an artificial pneumoperitoneum, particularly in the individual who has a contralateral infection, although generally the contralateral infection is not of great importance. If the phrenicectomy followed by pneumoperitoneum did not bring about a collapse of the cavity, I would suggest a lobectomy. There are many who believe that a lobectomy is the procedure of choice in such an instance, but it seems to me that a phrenicectomy and artificial pneumoperitoneum would be better as a preliminary procedure. One can always resort to a lobectomy later.

Question: Do you consider a 35 mm, 70 mm, or 4" x 5" photofluorogram

an adequate x-ray examination, initially, for nearly all contacts of known tuberculous persons?

Answer (Dr. Morgan): Yes. All of the photofluorographic films of today are entirely satisfactory for the detection of pulmonary tuberculosis.

Question: In treating a massive pleural effusion is it advisable to remove the fluid by repeated thoracenteses of a few hundred cc. at a time or to attempt to remove the entire effusion at once? Should air be instilled?

Answer (Dr. Waring): The treatment of massive pleural effusion should be repeated complete aspiration if the patient is dyspneic or shows circulatory disturbance or has much fever. In many instances fluid is best left alone, since it will spontaneously absorb. I would not replace the fluid with air under any circumstances. I assume we are dealing with a tuberculous pleural effusion.

Question: Do you believe bronchial adenoma is a malignant or nonmalignant tumor and why?

Answer (Dr. Bogen): Bronchial adenoma is, ordinarily, histologically benign, and pathologically gives little evidence of tendency to invasion or metastasis, although clinically it may be extremely disastrous to the patient, as a result of bronchial occlusion and secondary infection. However, bronchial adenomas may be multiple and rarely show evidence of malignant characteristics.

Question: What are the indications for primary thoracoplasty?

Answer (Dr. Ochsner): A large cavity at the apex is an indication for primary thoracoplasty. In this instance there are likely to be rather broad adhesions between the lung and the parietes, obviating collapse by pneumothorax, and even if collapse by pneumothorax were possible the large cavity would be better treated by a localized thoracoplasty, because one could not expect to get much restitution of function of that part of the lung, if any at all.

Question: Do you use tuberculin? If so, do you use it for any cases of pulmonary tuberculosis?

Answer (Dr. Waring): I do not use tuberculin in treatment but only for diagnosis.

Question: When pneumothorax is indicated, what bronchoscopic findings would, in your opinion, cancel or contraindicate pneumothorax?

Answer (Dr. Samson): We believe that pneumothorax should either be discontinued or is contraindicated when, bronchoscopically we find acute chronic ulcerative, granulomatous, or ulcero-stenotic lesions in either the bronchi or trachea. In the presence of bronchial disease of this nature there is a very high degree of probability that atelectasis either lobar or total will develop as the result of pneumothorax. Once developed, partial or total pulmonary collapse of this nature is very often irreversible. In addition, the dangers of empyema are heightened by the persisting pleural space which cannot be obliterated by expansion of the lung. A nonulcerative nonstenotic tracheo bronchitis, particularly if it is not acute, should not contraindicate pneumothorax if the patient is observed very carefully. The same applies to a rather limited group of healed stenoses which are local in extent and which have no inflammatory reaction about them. If the bronchial opening is greater than 5 or 7 mm in diameter and without any reaction, it is probable that a carefully watched pneumothorax is without undue hazard.

Question: What is your opinion about the abusive use of calcium salts by injections in the treatment of pulmonary tuberculosis?

Answer (Dr. Waring): Calcium salts are said to be helpful sometimes in preventing the recurrence of pleural effusion and are thought to be helpful in hastening the absorption of pleural effusion. In both instances the injection of calcium salts is not repeated many times. I have had no experience with "the abusive use of calcium salts."

Question: How do you confirm your diagnosis of sarcoid?

Answer (Dr. Morgan): The typical roentgenographic findings of sarcoid include masses of enlarged glands adjacent to the hilar areas of the lungs. In addition, there may be linear markings extending throughout both lung fields and frequently there may be small dehiscences within the bases of the phalanges of the hands. The finding of these changes within an individual, of course, does not constitute proof that the individual is suffering from sarcoid disease; such proof depends upon the microscopic changes that are observed by the pathologist.

Question: What is the status of pulmonary decortication in treating unexpandable tuberculous lungs?

Answer (Dr. Ochsner): This surgical procedure is still in the experimental stage and although the number of cases in which it has been done are few, there are very definite possibilities for it. Until recently, it was the consensus of most thoracic surgeons that thoracoplasty was the only procedure in patients with a very thick pleural rind, prohibiting the re-expansion of the lung. It has been astounding with what ease, however, decortication has been possible, and it is likely that in the future this procedure will be used much more frequently than it has in the past.

Question: How does the presence of a bronchial tuberculosis or tuberculous bronchitis affect the indications for collapse therapy?

Answer (Dr. Samson): This question can be partially answered by referring to the remarks on pneumothorax above. In my opinion, an acute ulcerative tracheobronchitis contraindicates collapse therapy of any sort. At most, a phrenic nerve interruption or pneumoperitoneum might be established. The latter should certainly be established carefully and the lung watched very carefully for signs of atelectasis. Dr. Trimble tells me that in his series of pneumoperitoneum cases the results in patients with complicating tracheobronchitis were much poorer than if the bronchial disease was not present. However, he did not feel that tracheobronchitis definitely contraindicated pneumoperitoneum. I believe that in acute ulcerative or granulo-ulcerative lesions attempt should be made to reduce the granulations by careful removal of the granulation tissues, curettage, and application of either 25 per cent silver nitrate or high frequency electrocautery. These measures are carried out in an attempt to keep the bronchus as open as possible and to promote healing. Recent studies on the effects of promine and streptomycin given by the aerosol technic indicate that tracheobronchial lesions may respond very well to this treatment. If this proves to be so with further study, it may mean that frequent bronchoscopy and local treatment may not be as necessary as they have been in the past. As the acute ulcerative process calms down with or without the development of stenoses it is possible that thoracoplasty can be performed with relative safety. There have been several articles by John Alexander, O'Brien and others on this subject. My personal experience indicates that if the presence of the stenoses

is known and proper precautions in the way of postoperative bronchoscopy are undertaken, a stenosis does not necessarily contraindicate thoracoplasty. The question of resection must always be decided in these cases. In my opinion, a resection is indicated if, because of the stenosis, there is definite secondary suppuration in the lung beyond the stenosis. In cases of this sort thoracoplasty gives poor results. Lobectomy or pneumonectomy is then indicated depending on how much of the lung may be involved. The so-called hyperplastic or nonulcerative nonstenotic type of tuberculous bronchitis usually is not a contraindication to whatever type of collapse may be necessary for the pulmonary lesions.

Question: Is hyperthyroidism ever associated with active tuberculosis? Why the rarity of this association?

Answer (Dr. Bogen): Active tuberculosis does not provide absolute safeguard against the development of hyperthyroidism, although the association is by no means common. There is a little experimental work suggesting that hypothyroidism at least may lessen resistance to tuberculosis, but the exact mechanism has not been elucidated, since tuberculosis of the thyroid gland itself is extremely rare. The mechanism of this incompatibility has not been worked out.

Question: Do you have any general rules for terminating pneumothorax? What is your opinion of continuing pneumothorax over prolonged periods—say 8 to 10 years?

Answer (Dr. Waring): It is hard to give a general rule for the termination of artificial pneumothorax. If the patient has become sputum negative and is clinically well and on a reasonable amount of exercise and the collapse has been fairly complete, I would stop the pneumothorax somewhere between two and three years after the sputum has become negative. Much will depend upon the condition of the lung before pneumothorax was started. I am not in favor of continuing partial pneumothorax except under conditions that demonstrate adequately that a partial collapse is really collapse of a diseased lobe. If pneumothorax has been continued eight to ten years, it is highly probable that the lung will not re-expand after pneumothorax has been stopped.

Question: Which is more important for a chest surgeon, a training in general surgery or a training of equivalent time in clinical and x-ray aspects of chest diseases and bronchoscopy?

Answer (Dr. Ochsner): As far as surgery is concerned, there is no equivalent for training in general surgery. Unless a chest surgeon is well grounded in the fundamental principles of general surgery, he is not able to treat patients who have thoracic problems. This is true not only of chest surgeons, but is also true of other surgeons as well. Whereas it is important for a man treating patients with chest diseases surgically to have experience in clinical and x-ray aspects of chest diseases and bronchoscopy, this training, however, does not prepare him for doing major surgery within the chest.

Question: In 40 cases of congenital cystic emphysema of the lung, followed for 15 years, 7 died of bronchial carcinoma. Could this be coincidence?

Answer (Dr. Bogen): In view of the increasing frequency of bronchial carcinoma, an incident of 18 per cent, although high, might still be merely the result of coincidence and not be confirmed in a larger series. On the other hand, the metaplasia sometimes found in association with cystic emphysema suggests that some carcinogenic compound may be

associated with this condition or that retention of pulmonary secretion or the retention of mammary or prostatic secretions may predispose to malignancy. More information is required before we can draw conclusions in this regard.

Question: Can bronchoscopy be better done by a person with clinical and x-ray training in chest diseases or not? And why?

Answer (Dr. Samson): I cannot answer this question without some qualifying statements. It should be emphasized that endoscopy is a highly technical procedure and as such, thorough training in the actual technic of passing either a bronchoscope or an esophagoscope is essential. This is certainly true whether one's background is otolaryngology, medicine, or surgery. Once having learned some of the fundamentals of the gross appearance of the tracheobronchial tree or esophagus, it seems to me that there is little question but what the man whose background consists of medical or surgical thoracic training is much better qualified to interpret endoscopic findings than one who has not had such a training. No man whose prior training has been essentially confined to otolaryngology can hope to remain on a par, endoscopically speaking, with one whose training has been primarily in thoracic disease, unless the otolaryngologist spends much time and study on diseases of the chest and has the opportunity of correlating that knowledge with many endoscopic examinations.

Question: If the primary infection is caused by the bovine bacillus, is the human type capable of causing the reinfection?

Answer (Dr. Bogen): Certainly, this is true. Griffiths in England and Jensen in Scandinavia have demonstrated instances of human-type tubercle bacilli obtained from sputa of patients from whom bovine types of bacilli have previously been obtained, from gland or other lesions. Lurie Murray has also demonstrated the superimposition of one type on another in experimental work in animals.

Question: Please discuss the causes of the edema often seen in patients dying of pulmonary tuberculosis.

Answer (Dr. Waring): The edema in patients dying of pulmonary tuberculosis is probably due to one or more of the following: 1) severe malnutrition, 2) severe hypoproteinemia, 3) amyloid disease of the kidney, 4) nephritis, 5) nephrosis.

Question: Discuss the management of a moderate sized pleural effusion that is asymptomatic in the course of induced pneumothorax in pulmonary tuberculosis.

Answer (Dr. Ochsner): Repeated aspirations of the pleural fluid with replacement of air.

Question: How do you establish the cause for repeated hemoptysis in a patient with negative x-ray films of the chest?

Answer (Dr. Samson): The cause may be very easy or very difficult to establish. I presume that Dr. Adams means by negative x-ray films of the chest, the ordinary studies such as frontal and lateral views and fluoroscopy have been carried out. Further studies which occur to me would be, of course, bronchoscopic examination, careful bronchograms of the lungs done preferably at two sittings, and, probably tomograms of the chest. It occasionally happens that tumors, either adenomas or carcinomas, which are not large enough to obstruct completely a bronchus and therefore show no evidence of their presence on ordinary x-rays, can be the source of bleeding of this type. Minor degrees of bron-

chiectasis, particularly that hidden behind the heart, can be a source of repeated hemorrhage with a normal or relatively normal x-ray. In very rare instances tuberculous bronchitis has been described as a primary disease without evidence of pulmonary tuberculosis and this can be a source of bleeding though it is difficult if not impossible to uncover. I have bronchoscoped two or three of these people during the time that they are bleeding and there appeared to be almost a dyscrasia of the tracheobronchial mucosa in which many bleeding points could be seen without obvious cause. The treatment of this latter group is very unsatisfactory and at the present time I have not discovered a reasonable or logical explanation for such bleeding.

Question: Discuss the value of x-ray therapy in gland and pulmonary tuberculosis.

Answer (Dr. Morgan): X-ray therapy has been widely used in the treatment of lymphadenitis of the neck. By and large, the results are favorable. The glandular enlargement diminishes within a short time after the administration of the therapy in most cases. In other cases, the extent of the pathology is sufficiently localized to permit satisfactory surgical intervention. In a few cases x-ray therapy has no effect whatsoever. Fortunately, cervical lymphadenitis has become a rather rare disease since pasteurization of milk has been instituted. X-ray therapy has no place in the treatment of pulmonary tuberculosis.

Question: To what extent should bed-rest in pulmonary tuberculosis be carried out?

Answer (Dr. Waring): Bed-rest is important during the active, acute stages of pulmonary tuberculosis. Bed-rest must be individualized. No general rules can be given for its use. I have frequently kept the patient in bed until the sputum became negative, even if this took a couple of years. Rigid bed-rest is imperative during the early stages of the acute process when the patient has fever. Later, bathroom privileges are permitted. I doubt very much if pulmonary embolism and thrombophlebitis are frequent in the young patients kept at prolonged bed-rest. In older patients one must bear in mind the possibility of thrombophlebitis and pulmonary embolism.

Question: Is the active progressive tuberculosis acquired in tuberculin positive children after B.C.G. vaccination a primary phase or reinfection type?

Answer (Dr. Bogen): Tuberculosis developing soon after vaccination with B.C.G. probably as a result of infection acquired before B.C.G. may manifest primary phase characteristics such as lymphoid adenopathy and later calcification. Infection acquired after the B.C.G. vaccination, however, is practically always of reinfection type without glandular adenopathy and with little tendency to calcification.

Question: Is there any method of determining pre-operatively the expansibility of a lobe one wishes to leave in following lobectomy? Would like to cite a case in which left lobe and lingula were removed and although upper lobe appeared normal, the anesthetist was unable to re-expand it by positive pressure, though it appeared well aerated. Post-operatively the upper lobe failed to re-expand with suction drainage and the patient subsequently developed an empyema which had to be obliterated by a basal thoracoplasty.

Answer (Dr. Samson): The only determination of which I know pre-operatively would be bronchoscopy to see whether the bronchial orifice

was patent; careful lipiodol bronchograms to determine evidence of bronchial pathology in the lobe; and the appearance of the lobe by usual x-ray projections and fluoroscopy. In the case cited in the question I can only suggest a possible answer: A lobe which appears normal when the chest is opened and which collapses during operation should be re-expandable. If this is not possible during operation when the anesthetist exerts a positive pressure, I believe it is almost certain the bronchial orifice has become occluded by heavy secretions which probably have been squeezed out of the diseased lobe during operation. I, myself, have proved this to be true on one or two occasions when, at the end of operation, the anesthetist was unable to re-expand a remaining lobe following lobectomy. On these occasions I have immediately bronchoscoped the patient before closing the chest and have been able to aspirate tenacious purulent sputum which was plugging and obstructing the lobar bronchus. Following this maneuver, positive pressure resulted in prompt re-expansion of the remaining lobe. This is an extremely important point because if the lobe does not expand an empyema is almost inevitable with a resultant situation which is probably more serious for the patient than if the entire lung had been removed at operation. In such a case bronchoscopy is not only advisable but mandatory before the chest is closed to be sure that bronchial obstruction is not present. Suction drainage with high negative pressure does not answer the problem since, if the lobe cannot be pushed out by positive pressure neither can it be pulled out by high negative suction when the bronchus is occluded. It is our custom routinely to bronchoscope all patients immediately after operation on whom major resection has been done. We believe that such a procedure removes offending secretions before they have a chance to obstruct other portions of the remaining lobe or of the opposite lung and is an important factor in reducing post-operative morbidity from atelectasis pneumonitis, bronchial fistula, and empyema.

Question: When is a tuberculous patient considered as completely cured?

Answer (Dr. Waring): A tuberculous patient may be considered completely cured when he has been without symptoms and with a negative sputum under ordinary conditions of life for at least five years. Pulmonary tuberculosis is prone to relapse even after many years of freedom from symptoms. To answer the question would require definition of the word "cure".

Question: In a case of tracheobronchial tuberculosis with partial obstruction of left main bronchus with visible obstruction near carina would you advise a thoracoplasty or a pneumonectomy?

Answer (Dr. Ochsner): Unless the obstruction was fairly high grade, interfering with the expulsion of secretions from the lung, I would prefer thoracoplasty as a preliminary procedure, explaining to the patient and family that possibly a pneumonectomy might have to be done later. Many of these patients, following the collapse obtained by thoracoplasty will require no further therapy. In the individual who is not sufficiently improved, pneumonectomy can be done at a subsequent time.

Question: Discuss diagnosis and management of a patient with pulmonary tuberculosis and cor pulmonale.

Answer (Dr. Waring): I would base the diagnosis of cor pulmonale in a patient with chronic pulmonary tuberculosis upon the signs of right ventricular enlargement and strain. The treatment is very difficult, since

it is not possible to reverse the causes of his pulmonary hypertension which are: 1) severe fibrothorax, 2) massive pleural adhesions, 3) severe wide-spread pulmonary fibrosis, 4) emphysema. I try to anticipate his right heart strain and get my patient out of the high altitude and down to sea level, and limit his activities.

Question: What are the indications and contraindications for lung resection in tuberculosis as you see them?

Answer (Dr. Ochsner): We have taken a very conservative attitude concerning pulmonary resection for tuberculosis. One definite indication is high grade bronchial stenosis, which is a mechanical lesion, the result of the tuberculosis, and the resection is done because of the mechanical defect rather than the tuberculous process itself. Another indication is the persistence of positive sputum after satisfactory thoracoplasty. Although the number of cases is small, it is still a definite indication. Tuberculomas are also indications for resection. Many times a tuberculous lobe is resected under the mistaken diagnosis of neoplasm and the lesion is proved microscopically to be tuberculoma. Although many are of the opinion that in basal cavities lobectomy should be done, we have felt that lobectomy should be reserved for the patient who does not respond to phrenicectomy and artificial pneumoperitoneum.

Question: What importance do you place on the occasional positive sputum in the clinically well patient?

Answer (Dr. Waring): I am not sure I understand the question, but the presence of tubercle bacilli in the sputum is always cause for anxiety since: 1) it is a menace to the friends and relatives of the patient even though he appears to be clinically well, and 2) it may indicate a small ulcer in the bronchus that is continuing to shed tubercle bacilli. I must admit that tubercle bacilli have been found in the sputum recovered from the stomach in conditions which would indicate that the patient was in excellent condition, able to resume a normal life or actually leading a normal life. In conclusion, one must not view presence of tubercle bacilli under these circumstances with complacence. The patient must be kept under observation.

Question: Do you think that pseudobronchiectasis is a valid designation for those cases in which reversible dilatations of bronchi occur?

Answer (Dr. Ochsner): I do not like the designation "pseudobronchiectasis," because the individual who has dilatation of the bronchi has bronchiectasis and not pseudobronchiectasis. I much prefer the term "functional bronchiectasis," because I believe as a result of infection of the bronchi, functional dilatation of the bronchi can occur. The process is reversible, because following control of the infection the dilatation disappears. It is only after destruction of the elastic tissue and bronchial musculature and replacement by scar tissue that the anatomic change so characteristic of bronchiectasis is seen.

Question: Please comment on reports of Dr. Dubos' findings.

Answer (Dr. Bogen): Dubos has unquestionably made a great contribution to the study of the bacteriology of the tubercle bacillus, although the practical application of his findings is not yet readily evaluated. Rene J. Dubos (author of "The Bacterial Cell" and discoverer of the first antibiotic agent to be isolated, in a pure state—that against the pneumococcus—which thus paved the way for the discovery of penicillin and streptomycin) in April of 1945 described remarkable rapid growth of tubercle bacilli under the surface of fluid media containing purified

phosphatide or certain synthetic detergent agents. In May of 1946 he reported further observations, amplifying this discovery. Tubercle bacilli had been grown under the surface of media by Youmans, Drea, Friedmann and others, but Dubos apparently gave us the first conclusive evidence that this might occur following minimal inoculations, and the publicity following his report has greatly stimulated further investigations. At the time of this meeting, I have seen the Dubos medium but have had no personal experience with it, and it is still questionable whether it may be clinically practicable. It has undoubtedly been an advance in the study of the bacteriology of the tubercle bacillus which may lead to practical application which can now be only dimly anticipated.

(Author's note, January, 1947: At that very time, June 1946, Foley, in the Proceedings of the Society for Experimental Biology and Medicine, actually reported the use of Dubos' medium as a diagnostic agent, and my own further studies have tended to confirm Dubos' claims.)

Question: Is high protein intake justified in proven (?) tuberculous empyema.

Answer (Dr. Waring): Yes.

Question: Have you observed the pneumothorax lung expanding under fluid, displacing the fluid upward in spite of gravity? Explain.

Answer (Dr. Ochsner): Yes, this has been observed and is due to a detachment of the lung below.

Question: How often in your experience does hemorrhagic effusion occur? I have had two cases recently. Why not oftener? Would you aspirate and replace with air or just aspirate? My case was aspirated and is O. K.

Answer (Dr. Waring): In my experience hemorrhagic effusion in pulmonary tuberculosis has been quite rare. I would not aspirate and replace with air but would just aspirate.

Question: What methods may be used to handle mediastinal herniation complicating artificial pneumothorax?

Answer (Dr. Ochsner): The best method is to decrease the tension within the hemithorax. An attempt has been made to stabilize the mediastinum by injecting small amounts of oil into the pleural cavity, and, although this does stabilize the mediastinum, it has the distinct disadvantage that it produces pleural reaction elsewhere and is likely to produce exudation and sufficient reaction of the pleura covering the lung that re-expansion may be interfered with. Certainly the results from the oil are worse than the advantages. By decreasing the pressure within the hemithorax, herniation will be relieved.

Editorial

MEDICAL RESEARCH

The medical profession has little reason to be proud of its record in medical research, nor can our profession be complacent about the future of strictly medical research.

If we study the records for coordinated information on medical research in this country, we realize how scanty and sketchy it is. As Gregg so aptly puts it, "We find only the poorly cultivated fields of clinical research."

Medical Research has always lagged as evidenced by the fact that nicotinic acid was known to chemists as early as 1867. However, it was not until 1938—seventy-one years later—that this substance was found to be highly efficacious in the treatment of pellagra. It is appalling to think of how many pellagra patients could have been cured or benefitted during those 71 years.

Sulfanilimide was known to most chemists 30 years before it was put to clinical use. It is impossible to estimate the number of individuals who were deprived of the benefits of this drug during those 30 years. It was 14 years after Fleming discovered penicillin before a substantial number of cases were treated in order to evaluate it as a clinical asset. Again, for at least 10 or 12 years, the people of the world were deprived of the benefits of penicillin. There are in existence today, a half-dozen vitamins, the medical uses of which are entirely unknown and unexplored.

We speak of the great progress of medical science during the past two or three decades, and we can be truly proud of this progress, however, as a medical profession, we can take only a small part of the credit for this progress. The basic discoveries, which have contributed so much to medical progress, were made by scientists in other fields. Medical research up until the present time has concerned itself, chiefly, with the application of the materials and scientific aids discovered by others. It is true, of course, that a great deal of medical research has been carried on in such diverse branches as surgery, psychiatry, pathology, and public health.

There are many reasons why medical research has lagged far behind research in other fields; first, because there is a dearth of medical researchers; second, those who are doing medical research today are mostly men, who, for financial reasons, must practice medicine or teach, therefore, making it impossible to devote their full time to research; third, much of the medical

advance of recent years has been due to the activities of a few private foundations and is not based on public subscription. Think what it would mean if we physicians would add 5 per cent to our medical fees in each case and set it aside for research, upon the disease or diseases which we are treating. Research work is like work in any other field; those doing the work must be compensated. Industry recognizes this and has set up research departments manned by scientists. Industry spends millions of dollars in research—the medical profession, as a whole or even in part, has not provided funds for medical research.

The American College of Chest Physicians has recently created a research council. This council is made up of two sections: A Scientific Section and a Financial Section.

The Scientific Section is now studying and formulating plans for specific research in the field of Diseases of the Chest. They are studying the problems which most obviously should be turned over to research workers and, also, studying personnel best equipped to carry on such research. The days of the lone-wolf researcher are about over. Medical problems, as yet unsolved, are so complex that no one man alone can cope with them. It now requires teams of specialists and scientists such as biologists, micro-biologists, chemists, and bio-chemists, bacteriologists, physicists, as well as medical men working together if real progress in medical research is to be accomplished.

The Financial Section will assist in securing funds and will finance a research project once it has been thoroughly investigated and finally recommended by the scientific section, however, both the scientific section and the financial section must unanimously approve the project and the expenditure. In this way research funds will be carefully protected.

The American College of Chest Physicians is a young organization; however, in the past 13 years it has grown to be one of the outstanding specialty organizations in the world. We believe we are the first of such organizations to sponsor medical research. For that reason we are receiving much favorable comment from directors of foundations and philanthropists who are interested in assisting medical research. They recognize that medical research will be more intelligently directed and funds more wisely expended when sponsored by a group such as the American College of Chest Physicians, because it has shown its interest by creating a basic research fund of its own and establishing a highly capable research council.

We are sure that the Fellows of the American College of Chest Physicians are justly proud of the accomplishments of our organization and will join whole-heartedly in assisting this, its most

important movement. There is hardly a fraction of the much-needed medical research being done in the field of Diseases of the Chest. Time has proved medical research must be supported, at least in part, by the medical profession itself. It is our hope that the American College of Chest Physicians will be one of the leaders in this field.

C. M. H.

Editorial

THE PAN-AMERICAN CONGRESS ON TUBERCULOSIS

The Pan-American Congress on Tuberculosis is one of the most outstanding meetings of professional workers in diseases of the chest held on the western hemisphere. This is a biennial event attended by delegates from all of the Central and South American nations and the United States. The Seventh Congress was held in Lima, Peru, March 17-22, 1947. The President, Professor Ovidio Garcia Rosell, of Lima, together with the other chest specialists of that city, did themselves proud in making arrangements for the meeting. Several of them gave up all other activities, including their office practices, for the first three weeks in March and devoted their time exclusively to arrangements for this important meeting so every possible attention could be given to their guests while the Congress was in session. The hospitality they manifested was superb. No stone was left unturned to provide for the comfort, entertainment and instruction of each individual delegate. Several of the leading chest specialists entertained delegates in their homes. The hospitals offered every facility for instruction, and ample opportunity was afforded to visit the oldest university on the western hemisphere, including its fine school of medicine. Even the President of Peru entertained members of the Congress in the presidential palace.

Before the regular sessions of the Congress, a large number of papers on many phases of tuberculosis and other chest diseases were presented. Results of original scientific and clinical investigations were reported. Many fine contributions to our knowledge of diseases of the chest have been made by physicians and scientists in the Central and South American countries. Much excellent investigative work is now in progress in these countries.

Dr. I. Cosio Villegas, of Mexico, was elected president and the next Congress will be held in Mexico City in 1949. Every physician practising diseases of the chest on the western hemisphere who can possibly arrange to attend this Congress should do so. Dr. Cosio Villegas and his co-workers are already developing plans for this important meeting. A display of sincere hospitality is assured and a program from which all can greatly profit will be presented. Here will be another opportunity for physicians from all the Americas to join hands and strive for the eradication of some of the worst destroyers of mankind.

J. A. M.

VII Congreso Pan-Americano de la Tuberculosis (ULAST)

LIMA, PERU

March 17 - 22, 1947

Delegates from seventeen Latin-American countries and the United States assembled at Lima, Peru, March 17-22, to participate in the seventh Pan-American Congress against tuberculosis.

The following subjects were discussed among the delegates of the various countries at this Congress:

1. Results of mass tuberculosis surveys.
2. Tuberculous tracheobronchitis.
3. Social and economic problems of the tuberculous.

The following papers were presented by invited guest speakers from the different countries:

"Unresolved Pleurisy. (Physiopathogenic Aspects and Treatment),"
Nicholas Romano, M.D., Buenos Aires, Argentina.

"Physiology of Respiration in High Altitudes,"
Carlos Monge, M.D., Lima, Peru.

"Oleothorax" (Presentation of a Series of Cases),
Jorge A. Higgins, M.D., F.C.C.P., Guayaquil, Ecuador.

"The Excision of Tuberculous Lungs"; "Experiences in the Treatment of Tracheobronchial and Other Complicated Forms of Tuberculosis"; and *"The Technique of Pulmonary Segmental Resection,"*
Richard H. Overholt, M.D., F.C.C.P., Brookline, Massachusetts, U.S.A.

A great interest was shown in the scientific discussions and all of the sessions were well attended.

COUNCIL ON PAN AMERICAN AFFAIRS

The Council on Pan American Affairs of the American College of Chest Physicians held a breakfast meeting at the Hotel Bolivar on Wednesday, March 19th. This session was attended by the following members of the Council and delegates:

Alonso Vial, Armando, Santiago, Chile.
Antezana Estrada, José, La Paz, Bolivia.
Araujo, Cesar de, Bahia, Brazil.
Arboleda Diaz, Carlos, *Governor*, Bogotá, Colombia.
Baldó, José Ignacio, *Governor*, Caracas, Venezuela.
Corbalán T., Gonzalo, *Governor*, Santiago, Chile.
Coronado Iturbe, Enrique, *Governor*, Guatemala City, Guatemala.
Cosio Villegas, Ismael, *Governor*, Mexico City, D. F.
Criollo Rivas, Julio, Caracas, Venezuela.
Eloesser, Leo, *Vice-Chairman*, San Francisco, California, U.S.A.
Etzel, Eduardo, Sao Paulo, Brazil.
Fajardo Castillo, Jorge, Guayaquil, Ecuador.
Fernandez, Reginaldo, *Governor*, Rio de Janeiro, Brazil.
Freile, Gonzalo, Guayaquil, Ecuador.
Garcia Capurro, F., Montevideo, Uruguay.
Garcia Rosell, Ovidio, *Governor*, Lima, Perú.
Garreton Unda, Ildefonso, *Governor*, Concepcion, Chile.

LUNCHEON MEETING, PERUVIAN CHAPTER,
American College of Chest Physicians
Yacht Club, Lima, Perú, March 21, 1947

Members and guests of the American College of Chest Physicians who attended the Luncheon Meeting sponsored by the Peruvian Chapter of the College at the Yacht Club, Lima, Perú, on March 21, 1947.

Gomez, Fernando, *Governor*, Montevideo, Uruguay.
Higgins, Jorge, Guayaquil, Ecuador.
Hilleboe, Herman, Washington, D. C., U.S.A.
Howard, Ernest, Washington, D. C., U.S.A.
Jackson, Chevalier L., *Chairman*, Philadelphia, Pennsylvania, U.S.A.
Jimenez, Miguel, Mexico City, D. F., Mexico.
Kornfeld, Murray, *Executive Secretary*, Chicago, Illinois, U.S.A.
Lopez Vargas, Ramon, Valparaiso, Chile.
Lozano Roche, Aradio, Mexico City, D. F.
Mastellari, A. Vicente, *Regent*, Panamá City, Panamá.
Mejia C., Rafael J., Medellin, Colombia.
Mendoza, René G., Habana, Cuba.
Myers, J. Arthur, *Regent*, Minneapolis, Minnesota, U.S.A.
Narvaez, Victor, Lima, Perú.
Navarrete, Antonio, *Regent*, Habana, Cuba.
Noble, Carlos, Mexico City, D. F.
Nowak, Wenceslao, Guayaquil, Ecuador.
Overholt, Richard H., *Vice-President*, Brookline, Massachusetts, U.S.A.
Perez, José Antonio, Córdoba, Argentina.
Posse, Rafael, Buenos Aires, Argentina.
Sarmiento, Jorge, Lima, Perú.
Sayago, Gumersindo, *Regent*, Cordoba, Argentina.
Selva Leon, Bartolomé, Habana, Cuba.
Sierra Somerville, Victor, Santiago, Chile.
Soto Blanco, Juan, Montevideo, Uruguay.
Sweany, Henry C. (guest), Chicago, Illinois, U.S.A.
Vacarezza, Oscar, Buenos Aires, Argentina
Vacarezza, Raul, *Governor*, Buenos Aires, Argentina.
Valledor, Theodosio, Habana, Cuba.
Vargas Lopez, René, *Governor*, Managua, Nicaragua.

Dr. Jackson, Chairman of the Council on Pan American Affairs, presided at this meeting and introduced the officials of the College from the various countries. All of the Governors and Regents of the College presented interesting reports of the College activities in their respective countries. Dr. Sierra Somerville, the Secretary of the Chilean Chapter, announced that Chile had organized a College Chapter with 70 members. Dr. Baldó, Governor of the College for Venezuela, announced that Venezuela now has 22 members and has completed plans for the organization of the College Chapter in that country. Dr. Mastellari, Regent of the College for Central America, stated that the Central American countries had 24 members and that a Chapter of the College would be organized in El Salvador, Central America, in August.

Dr. Leo Eloesser, San Francisco, California, Vice-Chairman of the Council on Pan American Affairs of the College, who recently returned from China, was introduced and received a great ovation. Dr. Eloesser spoke of his experiences in China and of the potentialities of world organization.

PERUVIAN CHAPTER SPONSORS MEETING

The Peruvian Chapter of the American College of Chest Physicians sponsored a luncheon meeting at the Yacht Club, Lima, Perú, on Friday, March 21st. The meeting was attended by approximately 100 members of the College and invited guests from all of the Latin American countries and the United States. Dr. Máximo Espinoza Galarza, President of the Peruvian Chapter of the College, presided at this meeting. Dr. Leo Eloesser, Vice-Chairman of the Council on Pan American Affairs of the College, was introduced by Dr. Gumersindo Sayago, Regent of the College for Argentina. Dr. Eloesser's report is published elsewhere in this issue of the Journal.

Remarks of Dr. L. Eloesser

Vice-Chairman of the Council on Pan American Affairs of the American College of Chest Physicians at the luncheon tendered on March 21, 1947 by the Peruvian Chapter of the College to the visiting delegates.

Dr. Max Espinoza Galarza, President of the Peruvian Chapter;

Dr. Ovidio Garcia Rosell, President of ULAST;

Fellow members:

Dr. Chevalier L. Jackson, Chairman of the Council on Pan American Affairs, has asked me to take his place in trying to thank you for your countless courtesies, and in attempting to express the gratitude of the American College of Chest Physicians for the generous cordiality with which you have received us. I fear however, that not only I, but the far more articulate representatives of Central and South American countries who were to speak at this luncheon will have to yield to the clamours of our Lady, The Sea. The thunder of her surf drowns our voices however strongly we may raise them. I shall therefore report to you on the activities of the College for the past year through the columns of the Journal instead of by word of mouth, and shall merely attempt to express the sentiments of all visiting delegates in begging you to accept our profound gratitude and appreciation for your lavish and bounteous hospitality.

The College now counts 8 chapters in Latin American countries with a membership of 380. Besides these it has a chapter in Greece with 15 members; South African, Australian and Chinese chapters are contemplated. The Argentinian Chapter has 66 members. (Dr. Gumersindo Sayago, Regent; Dr. Raul F. Vacarezza, Governor). Bolivia has 6 members, not yet sufficient for a seperate chapter. The Brazilian Chapter has 50 members. (Dr. Affonso MacDowell, Regent; Dr. Reginaldo Fernandez, Governor; Dr. Jose Silveira, Governor; Dr. Samuel Libanio, President). Central America, including Guatemala, Salvador, Nicaragua, Costa Rica and Panama, has 24 members and is about to organize a chapter (Dr. Amadeo V. Mastellari, Panama, is Regent; Governors for the Central American countries are: Dr. Coronado Iturbide, Guatemala; Dr Carlos Gonzalez, Salvador; Dr. Rene Vargas L., Nicaragua; Dr. Raul Blanco Cervantes, Costa Rica; and Dr. Augustin A. Sosa, Republic of Panama). Colombia has 10 members and is about to organize a chapter (Dr. Carlos Arboleda Diaz, Governor). Cuba has a chapter with 24 members (Dr. Antonio Navarrete, Regent; Dr. Octavio Rivero, Governor). Chile has the largest membership of any of the Latin American Republics; its chapter numbers 70 (Dr. Hector Orrego Puelma, Santiago, Regent; Dr. Gonzalo Corbalan, Santiago, Dr. Gilberto V. Zamorano, Valparaiso, and Dr. Ildefonso Garreton, Concepcion, Governors). Ecuador has 6 members, not yet sufficient for a chapter (Dr. Juan Tanca Marengo, Governor). Mexico has 39 members in its chapter (Dr. Donato G. Alarcon, Regent; Dr. I. Cosio Villegas, Governor). Paraguay has 3 members, not yet sufficient for a chapter (Dr. Angel Gines, Governor). Peru has a chapter with 22 members (Dr. Ovidio Garcia Rosell, Governor, and our host, Dr. Max Espinoza Galarza, President). Puerto Rico has 34 mem-

bers in its chapter (Dr. David E. Garcia, Regent; Dr. A. M. Marchand, Governor; Dr. Antonio Acosta Velarde, President). Uruguay has 4 members (Dr. Fernando D. Gomez, Governor). Venezuela has 22 members and is about to organize a chapter (Dr. Jose Ignacio Baldo, Governor).

Education: The College is vitally interested in both undergraduate and postgraduate education in diseases of the respiratory organs. A Textbook entitled "The Fundamentals of Pulmonary Tuberculosis and Its Complications (for the Student, the Teacher and the Practicing Physician," to which outstanding members of the College have contributed, is now being published under the auspices of the College by Charles C. Thomas Publishers of Springfield, Illinois and Baltimore. It should be off the press in about six months. Among the contributors may be mentioned Drs. Andrew L. Banyai, Emil Bogen, Benjamin L. Brock, E. W. Hayes, Sumner Cohen, C. M. Hendricks, Herman E. Hilleboe, Paul H. Holinger, Frank L. Jennings, S. U. Marietta, Jay Arthur Myers, Edwin R. Levine, C. Howard Marcy, Richard H. Overholt, Oscar Sander, J. Winthrop Peabody, Thomas J. Gilbert, Ralph C. Matson and William S. Conklin. A Spanish translation is projected. A Textbook of non-tuberculous diseases of the respiratory tract is also being prepared.

Postgraduate Education is being provided for by short postgraduate courses in Philadelphia and Chicago.

Professional Standards: The establishment and maintenance of adequate professional qualifications have been discussed. For the past five years candidates for admission to the United States Chapters of the College have been required to undergo examination, in order to assure of their proper professional preparation. The Mexican Chapter plans to conduct entrance examinations beginning in 1948; the Argentinian Chapter has similar plans.

Research: Although large funds for aid to research exist in the United States, the College has proposed to collect a Fund of its own for research. Fifteen thousand dollars is already on hand; a goal of $100,000 has been set. It is recognized that even this sum is insufficient for extensive or ambitious investigation; it is hoped, however, that the College may be in a position to lend weight to projects which meet with its approval by participating in funds allocated by other authorities, and may elicit larger grants from other sources by its own monetary contributions, giving an earnest, as it were, of its support.

Meetings of the College and Chapter meetings afford opportunity for interchange of scientific thought and opinion. We call especial attention to the coming meeting in Atlantic City on June 5 to 8. This meeting should be of uncommon interest. A most attractive and varied list of eminent speakers has been assured. Furthermore, the meeting immediately preceeds the Centenary Meeting of the American Medical Association, which will mark a milestone in the history of medical progress. Those contemplating attendance should communicate with Mr. Kornfeld immediately.

This report, Mr. President and Fellow-Delegates, although necessarily incomplete, may serve to sketch in outline some of the activities of your College. The spirit of this gathering makes it scarcely necessary to urge continuance of your hearty cooperation and support. We tender grateful recognition to our executive secretary, Mr. Murray Kornfeld, for his untiring enthusiasm and energy. We recognize that the College is *our* College. Its future lies in *our* hands and in *our* efforts.

13th Annual Meeting
American College of Chest Physicians

AMBASSADOR HOTEL, ATLANTIC CITY, NEW JERSEY

June 5 - 8, 1947

Atlantic City will be host this year to the American Medical Association and the American College of Chest Physicians, as well as to a number of other medical specialty societies who are planning to hold meetings there. It is anticipated that the attendance will be very large and we therefore urge you to make your hotel reservations at once if you are planning to go to Atlantic City for the meetings. Please write to the Ambassador Hotel for hotel accommodations for the College meeting, June 5-8, and to the Convention Bureau at Atlantic City for hotel accommodations for the meeting of the American Medical Association.

The preliminary Scientific Program for the College meeting was published in the March-April issue of Diseases of the Chest, and the final program has now been placed in the mails for delivery to College members. Some of the added special programs scheduled for the meeting are announced below.

"INFORMATION PLEASE IN DISEASES OF THE CHEST"

"Information Please in Diseases of the Chest" will again be presented as a feature of the College meeting. A group of recognized experts in medicine, surgery, pathology, bronchoscopy and roentgenology, as named below, will be on hand to answer your questions. All questions should be sent to the Executive Offices of the College in Chicago in advance of the meeting. The questions which are accepted will be published with the answers in "Diseases of the Chest." The Panel of Experts will be as follows:

Medicine: Hobart A. Reimann, M.D., Philadelphia, Pennsylvania
Surgery: Brian B. Blades, M.D., F.C.C.P., Washington, D. C.
Pathology: S. A. Levinson, M.D., Chicago, Illinois
Bronchoscopy: Henry B. Orton, M.D., Newark, New Jersey
Roentgenology: Eugene P. Pendergrass, M.D., Philadelphia, Pa.

LUNCHEON MEETINGS

Annual Conference of College Chapter Officials
Thursday, June 5th, 12:00 Noon, Hotel Chelsea

The Conference of College Chapter Officials will hold a luncheon meeting at the Annual Meeting of the College at which time problems of particular interest to the College Chapters will be discussed. Dr. Nelson W. Strohm, Buffalo, New York, Chairman of the Conference, will preside.

Council on Public Health
Friday, June 6th, 12:00 Noon, Hotel Chelsea

The Council on Public Health of the College is sponsoring a luncheon meeting to which all physicians are invited. The general topic of discussion will be: "Experiences of the United States Services in the Control

of Tuberculosis in World War II as Compared with World War I, and Plans for the Future." The speakers will be Dr. Francis J. Weber, Medical Director, Chief, Tuberculosis Control Division, U. S. Public Health Service, Washington, D. C., who will speak for the U. S. Public Health Service; Commander Sidney A. Britten, MC, USN, who will speak for the Navy; Dr. Roy A. Wolford, Assistant Chief of the Tuberculosis Division, Veterans Administration, who will speak for the Veterans Administration; and Dr. John B. Grow, Denver, Colorado, who will speak for the Army. Dr. John Barnwell, Chief, Tuberculosis Division, Veterans Administration, will summarize the discussions.

Dr. Paul A. Turner, Louisville, Kentucky, Chairman of the Council on Public Health, will preside at the meeting.

Conference of Medical Directors and Superintendents of Tuberculosis Hospitals and Sanatoria

Saturday, June 7th, 12:00 Noon, Hotel Chelsea

This Conference will be sponsored by the Council of Medical Directors and Superintendents of Tuberculosis Hospitals and Sanatoria of the College under the Chairmanship of Dr. Benjamin L. Brock, Chicago, Illinois. The reports of the Subcommittees on Sanatorium Standards and Rehabilitation will be made and there will be a general discussion of problems which concern medical directors and superintendents of our tuberculosis hospitals and sanatoria.

The guest speaker on this program will be Dr. Madge Thurlow Macklin, Ohio State University, Columbus, Ohio, and the subject of her talk is "Pitfalls in Dealing with Cancer Statistics, Especially as Related to Cancer of the Lung."

Conference of Tuberculosis Committees

Sunday, June 8th, 12:00 Noon, Hotel Chelsea

The National Council of Tuberculosis Committees of the College is sponsoring this Conference of all of the tuberculosis committees of the state and county medical societies for the purpose of exchanging ideas and information. There will be a talk by Dr. Carl H. Gellenthien, Valmora, New Mexico, on "Discussion of State and County Tuberculosis Committees." Dr. Tom D. Spies, Assistant Professor of Medicine, University of Cincinnati, Cincinnati, Ohio, has been invited to address the Conference and the subject of his talk will be "Recent Advances in Vitamin Research as Related to Clinical Medicine."

Dr. James H. Stygall, Indianapolis, Indiana, Chairman of the Council, will preside at the Conference.

BOARD MEETINGS

The Executive Council of the College will meet Thursday morning, June 5th.

The Board of Governors will hold its annual meeting on Thursday morning, June 5th.

The Board of Regents will meet Thursday afternoon, June 5th.

ADMINISTRATIVE SESSION

The Administrative session of the College will be held Friday morning, June 6th, at which time the Councils and Committees will report. The election of officers will follow.

CONVOCATION

The College will conduct a Convocation Saturday afternoon, June 7th, when Life Membership Certificates and Fellowship Certificates will be awarded. This will be a formal affair and will be open to members of the College, their families and friends. The Convocation will be conducted by the Board of Regents of the College and Dr. Robert Livingston Johnson, President of Temple University, Philadelphia, Pennsylvania, will address the assembly.

COCKTAIL PARTY AND PRESIDENTS' BANQUET

The Annual Presidents' Banquet will be held Saturday evening, June 7th. Dr. Charles M. Hendricks, President of the College, will deliver his presidential address, and the President-Elect, Major General S. U. Marietta, will be installed as President. The first College Medal will be awarded by Major General S. U. Marietta, who is Chairman of the Awards Committee of the College. The New Jersey and Pennsylvania Chapters of the College will be host at the cocktail party which will precede the Presidents' Banquet.

INTERNATIONAL NIGHT DINNER

Thursday night, June 5th, will be given over to the Councils on Pan Pacific Affairs, Pan American Affairs and European Affairs of the College and a Scientific program suitable for this occasion will be presented. Dr. Harry C. Warren, Chairman of the Council on Pan Pacific Affairs, will preside, assisted by Drs. Chevalier L. Jackson and Andrew L. Banyai, Chairmen of the Councils on Pan American Affairs and European Affairs, respectively.

CLINICAL - X-RAY - PATHOLOGICAL CONFERENCE

A Clinical - X-ray - Pathological Conference will be held at the Atlantic City Hospital on Sunday, June 8, at 5:15 P. M. Dr. Charles Hyman of Atlantic City is chairman of the Conference. Information regarding the Conference may be obtained at the Registration Desk in the Ambassador Hotel.

X-RAY CONFERENCE

The meeting will close on Sunday night, June 8th, with an X-Ray Conference which will be held at the Ambassador Hotel, starting at 8:00 P. M. Dr. Louis Mark will be Moderator at the Conference.

College Chapter News

CALIFORNIA CHAPTER

The California Chapter of the College held its annual meeting at the Biltmore Hotel, Los Angeles, on Friday afternoon, May 2, at the time of the annual meeting of the California Medical Association. The following program was presented:

"Bronchogenic Carcinoma of the Lung (with motion pictures)," Bert Cotton, M.D.
Discussion by Seymour M. Farber, M.D., F.C.C.P.

"Bronchiectasis — A Symposium,"
A. The Problem, J. J. Singer, M.D., F.C.C.P.
B. The X-ray Picture, R. W. Weathered, M.D.
C. Medical Management, David T. Proctor, M.D., F.C.C.P.
D. The Surgical Treatment, David J. Dugan, M.D.
E. Prevention, Reginald H. Smart, M.D.
F. Questions from the Floor.

"Advances in the Treatment of Tuberculosis,"
A. Medical
1. Promin in Laryngeal Tuberculosis, J. M. Black, M.D.
2. Streptomycin in Laryngeal Tuberculosis, Solomon B. Netzer, M.D.
3. Streptomycin in Pulmonary Tuberculosis, William Cassidy, M.D., F.C.C.P., Edward Dunner, M.D., and Forrest G. Bell, M.D., F.C.C.P.
Discussion by Emil Bogen, M.D.

B. Surgical
Indications for Pulmonary Resection in Tuberculosis, Lyman A. Brewer, III, M.D.
Discussion by Ambrose S. Churchill, M.D.

CHILEAN CHAPTER ORGANIZED

The Chilean Chapter of the American College of Chest Physicians was formally organized at Santiago, Chile, with Dr. Hector Orrego Puelma, President, and Dr. Victor Sierra Somerville, Secretary.

The following physicians have been appointed as Governors of the College in Chile:

Dr. Gonzalo Corbalan T., Santiago,
Dr. Gilberto Zamorano, Valparaiso,
Dr. Ildefonso Garreton Unda, Concepcion.

Dr. Hector Orrego Puelma is the Regent of the College for the country.

ILLINOIS CHAPTER

The Illinois Chapter of the College held its annual meeting at the Palmer House in Chicago on May 11, just prior to the meeting of the Illinois State Medical Society, May 12-14, 1947. The following excellent program was presented:

"Antibiotics in the Medical Treatment of Bronchial Infections,"
Edwin R. Levine, M.D., F.C.C.P., Chicago, Illinois.

"The Production of Pleural Adhesions for Therapeutic Purposes,"
John D. Steele, M.D., Milwaukee, Wisconsin.

"Diagnosis of Pulmonary Mycoses,"
Morris Moore, Ph.D., St. Louis, Missouri.

"Extrapleural Pneumothorax,"
Theodore R. Hudson, M.D., and Chester W. Moen, M.D.,
Edward Sanatorium, Naperville, Illinois.

Business Session
Julius B. Novak, M.D., F.C.C.P., Chicago, President, Illinois Chapter, presiding.

Dinner, Palmer House, Chicago

Dinner Speaker: Arnold Shamaskin, M.D., F.C.C.P., Chief, Tuberculosis Service, Veterans Hospital, Hines, Illinois.
"The Use of Streptomycin in the Treatment of Human Tuberculosis,"

MARYLAND - DISTRICT OF COLUMBIA CHAPTER

The Maryland-District of Columbia Chapter of the College had a most successful meeting in Baltimore on April 21. The program was carried out as published in the March-April issue of the journal, and the scientific meeting was very well attended.

At the business meeting it was voted to change the name of the Chapter to the "Potomac Chapter" because the original name seemed too cumbersome and did not include the West Virginia group. This matter will be taken under consideration by the Board of Regents of the College at their annual meeting in June.

Officers elected to serve for the ensuing year are as follows:

W. LeRoy Dunn, M.D., Washington, D. C., President
Otto C. Brantigan, M.D., Baltimore, Maryland, Vice-President
I. B. Lyon, M.D., State Sanatorium, Maryland, Secretary-Treasurer.

NEW JERSEY CHAPTER

The Annual Meeting of the New Jersey Chapter of the College was held in conjunction with the New Jersey State Medical Society on April 23, 1947, at the Chalfonte-Haddon Hall Hotel, Atlantic City, New Jersey. Thirty Fellows of the College attended the meeting and the scientific discussion was very interesting. Dr. Irving Willner, F.C.C.P., Newark, President of the Chapter, emphasized the National Meeting of the College and advised those who had not already done so, to make application at once to the Ambassador or Chelsea Hotels. After luncheon an address was made on "Chemotherapy in Tuberculosis" by Dr. George G. Ornstein, F.C.C.P., New York City. A number of chest x-rays presented by various members of the Chapter were discussed.

At the meeting, the following officers were elected for the coming year:

Harold S. Hatch, M.D., Morristown, President
Paul K. Bornstein, M.D., Asbury Park, Vice-President
Homer L. Cherry, M.D., Paterson, Secretary-Treasurer.

NORTH MIDWEST CHAPTER

The annual meeting of the North Midwest Chapter of the College will be held in Duluth, Minnesota, the afternoon of July 1st, in conjunction with the meeting of the Minnesota State Medical Association. The program is as follows:

"Follow-up Diagnostic Procedures of Roentgen Lesions Found by Survey Methods,"
W. Roemmich, M.D., Minneapolis, Minnesota.
Discussion by Jay Arthur Myers, M.D., F.C.C.P., Minneapolis, Minn.

"Commoner Intrathoracic Tumors,"
Thomas J. Kinsella, M.D., F.C.C.P., Minneapolis, Minnesota.

"Roentgen Diagnosis of Early Carcinoma of the Lung,"
Leo G. Rigler, M.D., Minneapolis, Minnesota.
Discussion by S. S. Cohen, M.D., F.C.C.P., Oak Terrace, Minnesota.

"Streptomycin in the Treatment of Tuberculosis,"
Karl H. Pfuetze, M.D., F.C.C.P., Cannon Falls, Minnesota.
Discussion by G. A. Hedberg, M.D., F.C.C.P., Nopeming, Minnesota, and Dexter Lufkin, M.D., F.C.C.P., Minneapolis, Minnesota.

Dr. Jay Arthur Myers, Minneapolis, Minnesota, will preside at the scientific session. There will be a luncheon for members and guests of the American College of Chest Physicians on Tuesday, July 1, at 12:15 P. M. The location for the luncheon will be announced later.

ROCKY MOUNTAIN CHAPTER

Dr. A. M. Mullett, F.C.C.P., Colorado Springs, Colorado, President of the Rocky Mountain Chapter of the College, has announced the following committee appointments:

Medical Education Committee:
Lorenz W. Frank, M.D., Denver, Colorado, Chairman
William C. Service, M.D., Colorado Springs, Colorado
William Ray Rumel, M.D., Salt Lake City, Utah
John A. Cremer, M.D., Denver, Colorado

Membership Committee:
John S. Bouslog, M.D., Denver, Colorado, Chairman
Irby Ballenger, M.D., Albuquerque, New Mexico
Albert Guggenheim, M.D., Denver, Colorado
Ralph Rigby, M.D., Salt Lake City, Utah

Program Committee:
B. T. McMahon, M.D., Denver, Colorado, Chairman
Arnold Minnig, M.D., Denver, Colorado
Robert O. Brown, M.D., Santa Fe, New Mexico
John B. Grow, M.D., Denver, Colorado

Publicity Committee:
Phineas Sparer, M.D., Spivak, Colorado, Chairman
Allan Hurst, M.D., Denver, Colorado
Henry Jernigan, M.D., Albuquerque, New Mexico

General Arrangements Committee:
W. Bernard Yegge, M.D., Denver, Colorado, Chairman
Jack Bartholomew, M.D., Boulder, Colorado
John G. Wolf, M.D., Pueblo, Colorado
H. M. Van Der Schouw, M.D., Wheatridge, Colorado

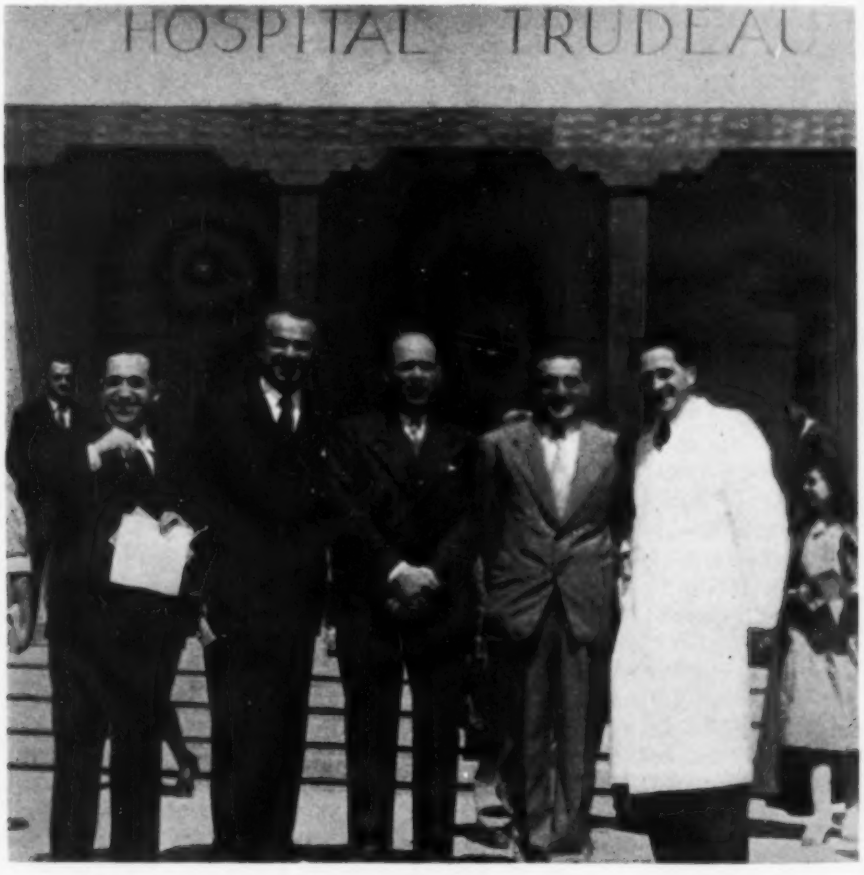
College News Notes

CHILE OPENS NEW SANATORIUM

Murray Kornfeld, Executive Secretary of the American College of Chest Physicians, participated in the dedication of the Trudeau Hospital at Santiago, Chile, on March 27, 1947. This 500-bed sanatorium was built jointly by the Coordinator of Inter-American Affairs of the U.S.A., and the Government of Chile. The hospital will be under the direction of Dr. Rafael Lorca O., who has been appointed as Superintendent and Medical Director. Dr. Theodore Gandy, representative of the Coordinator of Inter-American Affairs in Chile, gave the principal address at the dedication. The United States Government was represented by the Hon. Claude G. Bowers, Ambassador from the United States to Chile, and by other dignitaries. Mrs. Gonzalez Videla, wife of the President of Chile, represented the Chilean Government at the dedication.

Dr. Hector Orrego Puelma, Regent of the College for Chile, and Dr. Armando Alonso Vial, thoracic surgeon, Santiago, Chile, also participated in the dedication exercises.

Dedication of the Trudeau Hospital, Santiago, Chile, March 27, 1947



Left to right: Dr. Armando Alonso Vial, Dr. Hector Orrego Puelma, Dr. Theodore Gandy, Mr. Murray Kornfeld and Dr. Rafael Lorca O.

DR. OVERHOLT LECTURES IN SANTIAGO, CHILE

Dr. Richard H. Overholt, Brookline, Massachusetts, First Vice-President of the American College of Chest Physicians, delivered a series of lectures at Santiago, Chile on April 2, 3 and 4. The first lecture was given at the University of Chile, and the subject was "The Pulmonary Segments as a Unit of Excision." Two lectures were given at the Catholic University; the first on "The Principles of the Surgical Treatment of Tuberculosis," and the second on "The Principles of Surgical Treatment of Non-Tuberculous Chest Diseases."

The final lecture was delivered at the Sociedad Chilean de Tisiologia and Sociedad de Cirugia, on "Cancer of the Lung." All of the lectures were well attended, and a great deal of enthusiasm was exhibited by the doctors in Chile who came from many distant points to hear Dr. Overholt.

Dr. Overholt is continuing his trip through Argentina, Uruguay and Brazil, where he will conduct a series of lectures. The local Tuberculosis Societies in all of these countries are cooperating with the College Chapters in sponsoring these meetings.

See page 290 for photograph of Dinner given in Honor of Dr. Overholt.

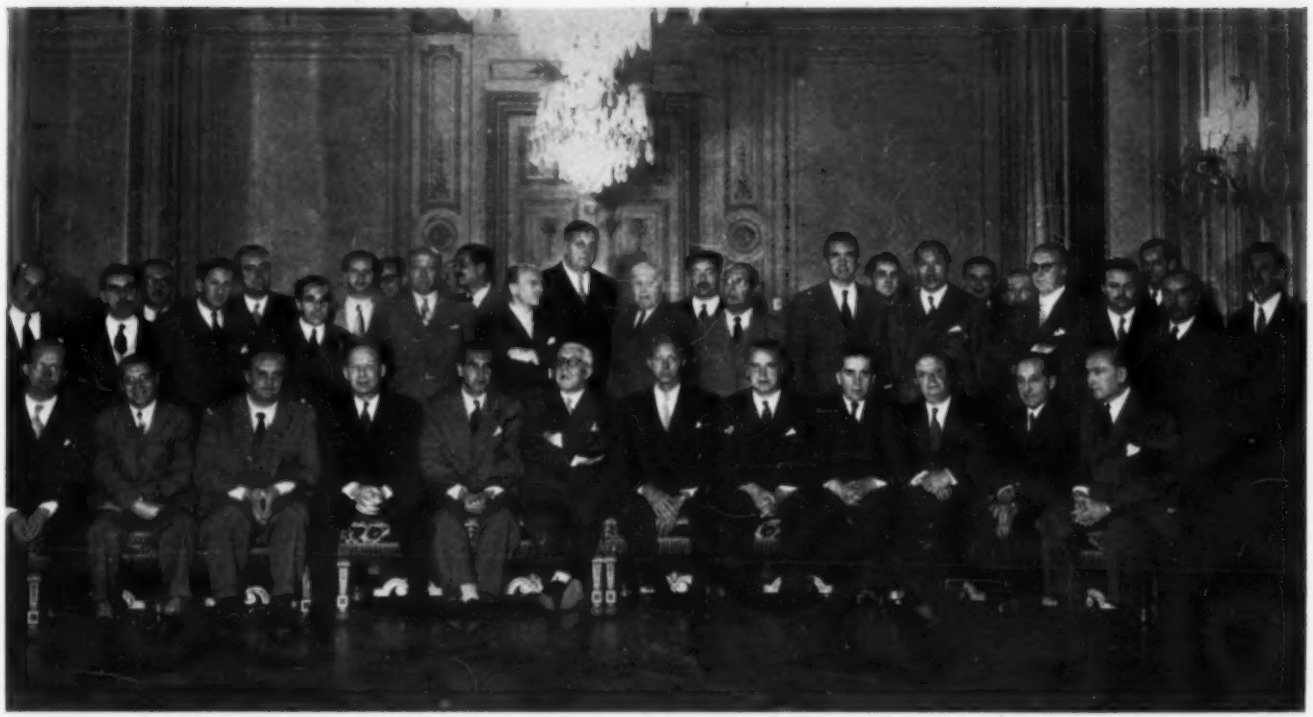
1949 ULAST CONGRESS

It was voted to hold the next ULAST Congress in Mexico City in 1949. Dr. I. Cosio Villegas, Governor of the College for Mexico, was elected President of ULAST. The Council on Pan American Affairs of the American College of Chest Physicians plans to participate in the next Congress.

Otto L. Bettag, M.D., F.C.C.P., Medical Director of Livingston County Tuberculosis Sanitarium and Tuberculosis Officer for Pontiac Reformatory, addressed the medical staff of the Peoria Municipal Tuberculosis Sanitarium on March 31. The subject of Dr. Bettag's talk was "Unusual Chest Cases," and films of interesting lesions of the chest were shown.

DINNER GIVEN IN HONOR OF DR. OVERHOLT

Club Union, Santiago, Chile



The above physicians attended the dinner given in honor of Dr. Richard H. Overholt at the Club Union, Santiago, Chile, April 8, 1947.

Medical Service Bureau

POSITIONS AVAILABLE

Approved Tuberculosis Sanatorium desirous of obtaining applications for residencies beginning July 1st. All types of compression and surgical therapy in the modern treatment of tuberculosis; 200 bed hospital; salary range $190 - $300; applicants please state experience, previous training, age and social background, etc. Please address Box 154A, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Resident physician wanted for 80 bed tuberculosis sanatorium approved by the A.M.A. and American College of Surgeons. Salary to $250 plus complete maintenance for single man. Send photograph and complete record of training and experience in first letter. Dr. D. F. Loewen, Medical Director, Macon County Tuberculosis Sanatorium, Decatur, Illinois.

Full time resident physician wanted at tuberculosis hospital; all phases of chest work; $350 per month with maintenance for man and wife; three room apartment. For further information please address Box 156A, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Resident staff physician wanted at 200 bed tuberculosis sanatorium; all forms of collapse therapy, major surgery, bronchoscopy. Salary $3,700 with complete maintenance. For further information address Box 157A, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Senior Staff physician and residents wanted at large tuberculosis sanatorium; full time departments in pathology and thoracic surgery; medical school affiliation; $4800 to $5400 per annum; complete or partial maintenance. For further information please address Box 158A, American College of Chest Physicians, 500 N. Dearborn Street, Chicago 10, Illinois.

Single physician wanted with at least three years sanatorium experience in diagnosis and treatment of tuberculosis; 125 bed tuberculosis hospital in Hawaii. Starting salary $6400.00 and complete maintenance. Send full credentials and available data first letter. Please address Box 159A, American College of Chest Physicians, 500 N. Dearborn Street, Chicago 10, Illinois.

Expansion King County Tuberculosis Hospitals in Seattle, requires additional staff. Excellent facilities, equipment. University Medical School affiliation. Young men, good training, interested teaching and research preferred. Chiefs of Service, $8400; Staff Physicians, $7200; Resident Physicians, $1800, plus free maintenance; Laboratory Technician, $2820; X - ray Technician, $2520; Medical Record Librarian, $2400. Maintenance at cost for single persons only. Write Firland Sanatorium, Richmond Highlands, Washington, giving full particulars and enclose photograph.

Young chest surgeon wanted to be associated with sanatorium and also do chest surgery on the outside. Attractive offer. For further information please address Box 155A, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Physicians wanted at small, privately endowed, Jewish institution with 25 beds, one physician. For further information please address Box 165A, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Position available for physician who has had some training in thoracic surgery or is interested in learning thoracic surgery at sanatorium in northwest. Salary at least $300 per month with maintenance. Opportunity to advance. For further information please write Box 167A, American College of Chest Physicians, 500 N. Dearborn Street, Chicago 10, Illinois.

POSITIONS WANTED

Fellow of the College, with 15 years full time hospital and sanatorium experience in tuberculosis and chest diseases, desires medical directorship in progressive institution with good clinical opportunities. For additional information, please address Box 232A, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Trained chest surgeon desires position as medical director of tuberculosis sanatorium, or as chest surgeon. For further information please address Box 233A, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Book Reviews

Clinical Electrocardiography. By David Scherf, M.D., F.A.C.P., Associate Professor of Medicine, New York Medical College, Flower and Fifth Avenue Hospitals, New York, and Linn J. Boyd, M.D., F.A.C.P., Professor of Medicine, New York Medical College, Flower and Fifth Avenue Hospitals. Second edition. Price, $8.00. J. B. Lippincott Company, 1946, Philadelphia.

The second edition of this work appears with a new page arrangement. Several suggestions seem worth offering. The discussion of the normal electrocardiogram still uses limits of normality which may be too narrow. The discussion of arteriosclerotic heart disease and myocardial infarction could be expanded. There is no unified discussion of the electrocardiographic changes during acute rheumatic fever. The chest leads are not well presented. Only leads CR2 and CR4 are utilized, and the discussion is contained in a separate chapter instead of bringing in the chest leads under each subject heading.

One of the pleasing features of the work is the effort made to correlate electrocardiographic changes with other clinical findings. The third section of the book on the services of stimulus formation and conduction is excellent and is in itself worth the purchase price.

G. N. A.

Pulmonary Tuberculosis in the Adult; Its Fundamental Aspects: By Max Pinner, M.D., Chief, Division of Pulmonary Diseases, Montefiore Hospital for Chronic Diseases, New York; Editor, American Review of Tuberculosis; Clinical Professor of Medicine, College of Physicians and Surgeons, Columbia University, New York. Cloth. Price $7.50. Pp. 579, with illustrations. Charles C. Thomas, Publisher, 301-327 East Lawrence Avenue, Springfield, Illinois, 1945.

This book is a thorough-going account of pulmonary tuberculosis in the adult. In the preface the author states that it is not a textbook. It does not attempt to tell the student how to diagnose the disease or how to treat it. It does not intend to give directions how to do this or that or the other thing in the practical performance of the clinician's duties. All this, he feels, the physician and student will find in textbooks now available. "The primary aim of this book is not to impart knowledge but to create understanding, to form rational and consistent attitudes and approaches to the problem as a whole, to provide the basically necessary foundations on which, in my opinion, the work should proceed. In order to present a consistently plausible picture it is necessary to express opinions. For better or worse, the opinions are my own. This does not mean that the opinions are original. They are not. They are a selection and a composition of the selections and opinions pronounced by many different workers."

The book contains 19 chapters, beginning with the tubercle bacillus. All phases of the disease, particularly in its pulmonary form, are presented in considerable detail. Every step in the development of tuberculosis is included from the time the tubercle bacillus first invades the tissues. Various diagnostic procedures are evaluated, and therapeutic measures and the results to be expected from them are presented. The last chapter is devoted to epidemiological principles. Like all others, this is an excellent chapter in which the available information is presented

and the shortcomings of the various procedures are discussed. Numerous suggestions are made which should lead to more extensive observation and study. The bibliography presented at the end of each chapter is unique. Brief annotations follow each reference as time-saving directions to the reader. The bibliographies were prepared with three purposes in mind: "They provide documentation for statements made in the text; they inform the reader of opinions contrary to those expressed in the text; they are guideposts to more complete information."

This is a fine volume which can be read with profit by medical students and physicians everywhere. The publisher has spared nothing in producing a book of pleasing and dignified appearance.

J. A. M.

Principles in Roentgen Study of the Chest. By William Snow, M.D., Director of Radiology, Bronx Hospital, New York City. Published by Charles C. Thomas, Springfield, Illinois.

Dr. Snow has given a very readable interpretation of chest diseases and abnormal findings within the confines of the thorax. An inclusive study of the chest has, therefore, been made in a broader sense. Not only are the lung fields and pleura discussed, but the bronchial tree, the mediastinum, and the diaphragm are given good consideration.

It is commendable, in a book of this kind, that concepts in diagnosis are evaluated with physiological and pathological approaches. Hence, the student may profit by a study of the book rather than consider it as an encyclopedic source used for a specific purpose.

Of special interest are the chapters discussing the "average" rather than the much-discussed "normal" chest, an evaluation of post-operative atelectasis, and the chapter dealing with special chest problems in children.

Illustrations are grouped in an atlas type of arrangement within each chapter. Comparative studies can thus be readily made. It is unfortunate that the reproductions are not as good as they might be. Reproductions of the original film on the half-tone has resulted in a contrast which is too great. Diagnostic criteria, particularly in parenchymal lesions are "damped" out. A part of this process must of necessity occur with all films which are transformed to a new medium and reviewed by reflected light rather than as a transparency.

The short but adequate bibliography is up-to-date. More than 75 per cent of the references are taken from the literature between 1940 and 1944.

This book is a worthwhile addition to the library of student, chest physician, roentgenologist, and general practitioner.

L. G. I.

The Lung. Second Edition. By William Snow Miller, Late Emeritus Professor of Anatomy, University of Wisconsin. 222 pages, with illustrations. Charles C. Thomas, Publisher, Springfield, Ill., 1947. Cloth, $7.50.

This book is one of the true classics in American medical literature. The author devoted 47 years to the study of anatomy of the lungs and brought to light much information which had never before been in possession of scientists and physicians. For more than 40 years Dr. Miller appeared by invitation before numerous scientific and medical organi-

zations, both national and international, to present his discoveries. His presentations usually constituted the highlight of such meetings. As facts were established, his articles appeared in the best scientific and medical journals of Europe and America. The first paper was published in 1892. Dr. Miller's laboratory at the University of Wisconsin was frequented by anatomists, clinicians and others from many parts of the world. His contributions are not only of high scientific value but also of great practical importance to the clinician. For example, he showed that the flow of lymph from the lung immediately subjacent to the visceral pleura is into the pleural channels whence it is carried to the nodes of the hilum region. This in part explains the mechanism by which tuberculous pleurisy develops from primary or reinfection type of lesions located in close proximity to the pleura. Again, the detailed study of the musculature of the ramifications of the bronchi provided facts which are of value to the physician in his understanding of the mechanism of some forms of asthma as well as response to medication.

As the world's most eminent authority on the anatomy of the lung, Dr. Miller was induced to assemble his contributions of 47 years to be published as a monograph. Copies of the first edition, published in 1937, are rare and highly prized by those who have them. Second and third printings were done in 1940 and 1943, respectively. The second edition contains the same material as the first but three color plates, 20 black and white plates, and about 40 pages of manuscript have been added to the third edition which greatly enhance the value of the book. This book contains 168 illustrations, many of which are in color. It is a handsome volume, and the publisher deserves a great deal of praise for every detail required for the manufacture of this fine classic. This book should be in the laboratory of every physician.

J. A. M.

DANIEL YELLIN

1915 - 1947

The death of Daniel Yellin on March 5th at the young age of thirty-two creates a loss to the medical profession which it can ill afford. After completing his medical schooling at the University of California, he interned in 1939 at Mount Zion Hospital. From 1939 to 1942, he was Resident of Chest Diseases in San Francisco Hospital. From 1941 to 1943 he was Medical Resident at the Hassler Health Home. He then went into private practice, achieving in four years a rather remarkable success. He not only in this short time, built a fairly large practice, but he became known to his colleagues and to the public at large as a very competent chest specialist and able physician. Quiet in demeanor, sincere and honest, he gave all he had to his patients and to his profession. Although he spent but a short time in this world in which he certainly would have succeeded magnificantly, he left his mark in the hearts of his patients and friends and won the respect of his colleagues.

John C. Sharp, M.D.
Governor for California.